

Leveraging AI and Alternative Data Sources to Address Data Gaps

The experience of the Arab Development Portal (ADP)

Ahmed Al-Awah, Director, Decision Support and Data Science Division (DSDSD) – UN ESCWA

What is the Arab Development Portal (ADP) initiative?

- A co-led initiative by UN-ESCWA and the Arab Fund for Economic and Social Development (AFESD) under the Arab Coordination Group (ACG) to build the region's flagship data and decision-support platform.
- The Arab Development Portal was conceived as a response to a persistent challenge in the region: the fragmentation, scarcity, and inaccessibility of reliable and harmonized data for policy and planning.
- Its vision is to enable a new generation of data-driven governance, one in which leaders and analysts can access trusted data and statistics, visualize emerging trends, and simulate policy options through AI-enhanced tools.

- The Arab Development Portal (ADP) integrates national, regional, and international datasets and wraps them with advanced analytics, AI/ML, and policy-support tools to enable evidence-based policymaking across Arab States.
- Designed as a comprehensive digital ecosystem, the ADP brings together verified data, advanced analytics, and artificial intelligence capabilities to strengthen evidence-based policymaking, research, and regional cooperation.
- It serves as both a knowledge hub and a decision-support infrastructure for policymakers, National Statistical Offices, researchers, and development practitioners working to advance sustainable development in the Arab region.

Quick Demo of ADP Portal

<https://www.arabdevelopmentportal.org>

ADP Approach for Leveraging AI

What do we want to solve and what do we need to measure?

Is AI the right tool? Does it extend a capability or enhance decision making in this area? Does it allow us to use alternative data to support advanced analysis with official data or when official data is absent? ...etc.

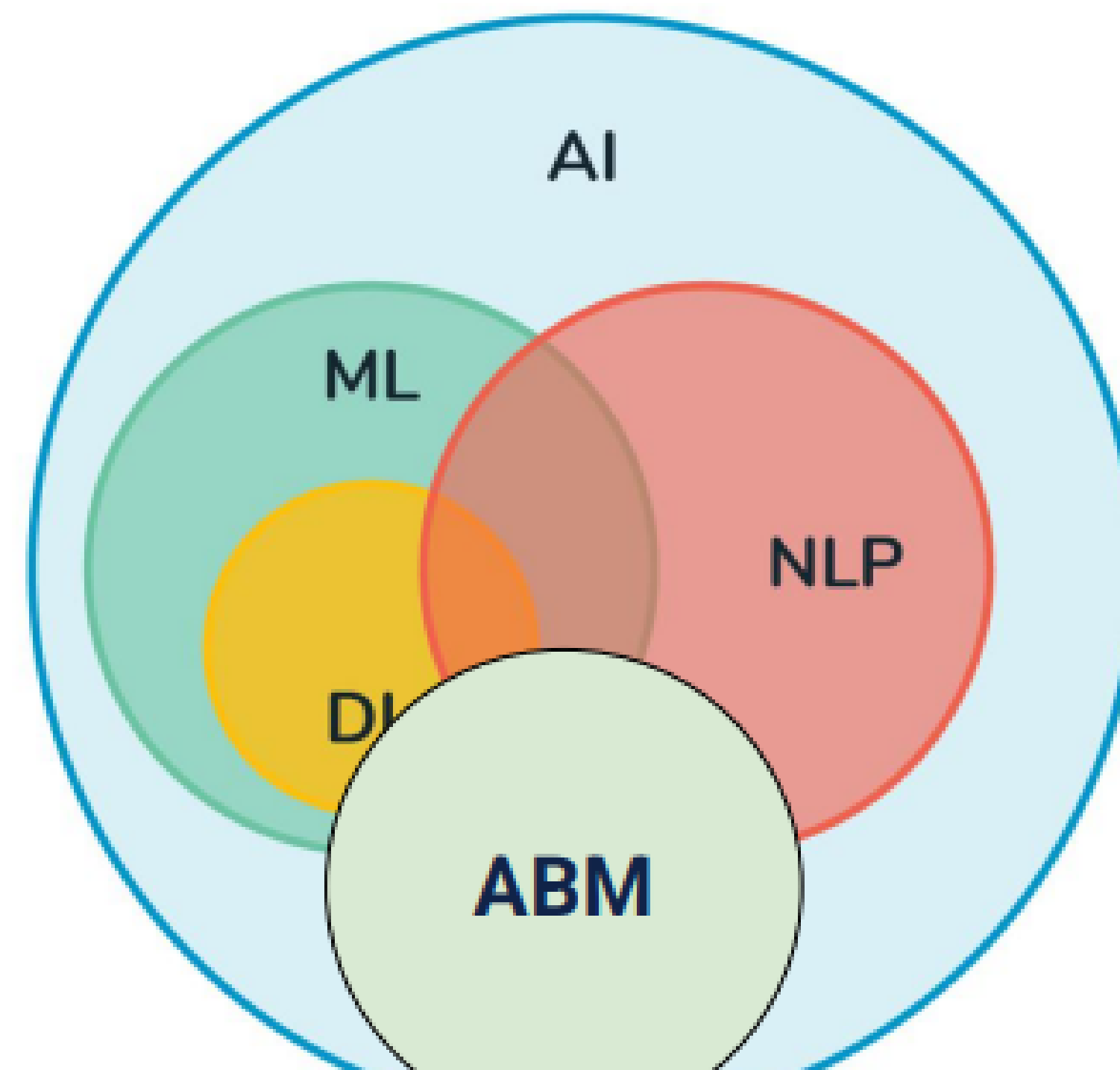
**If we believe so, then we go, from issue to data:
Purpose-built locally contextualized AI tools and solutions**

AI is more than LLMs

Artificial Intelligence

Def. *The ability of a computer to perform tasks commonly associated with human intelligence.*

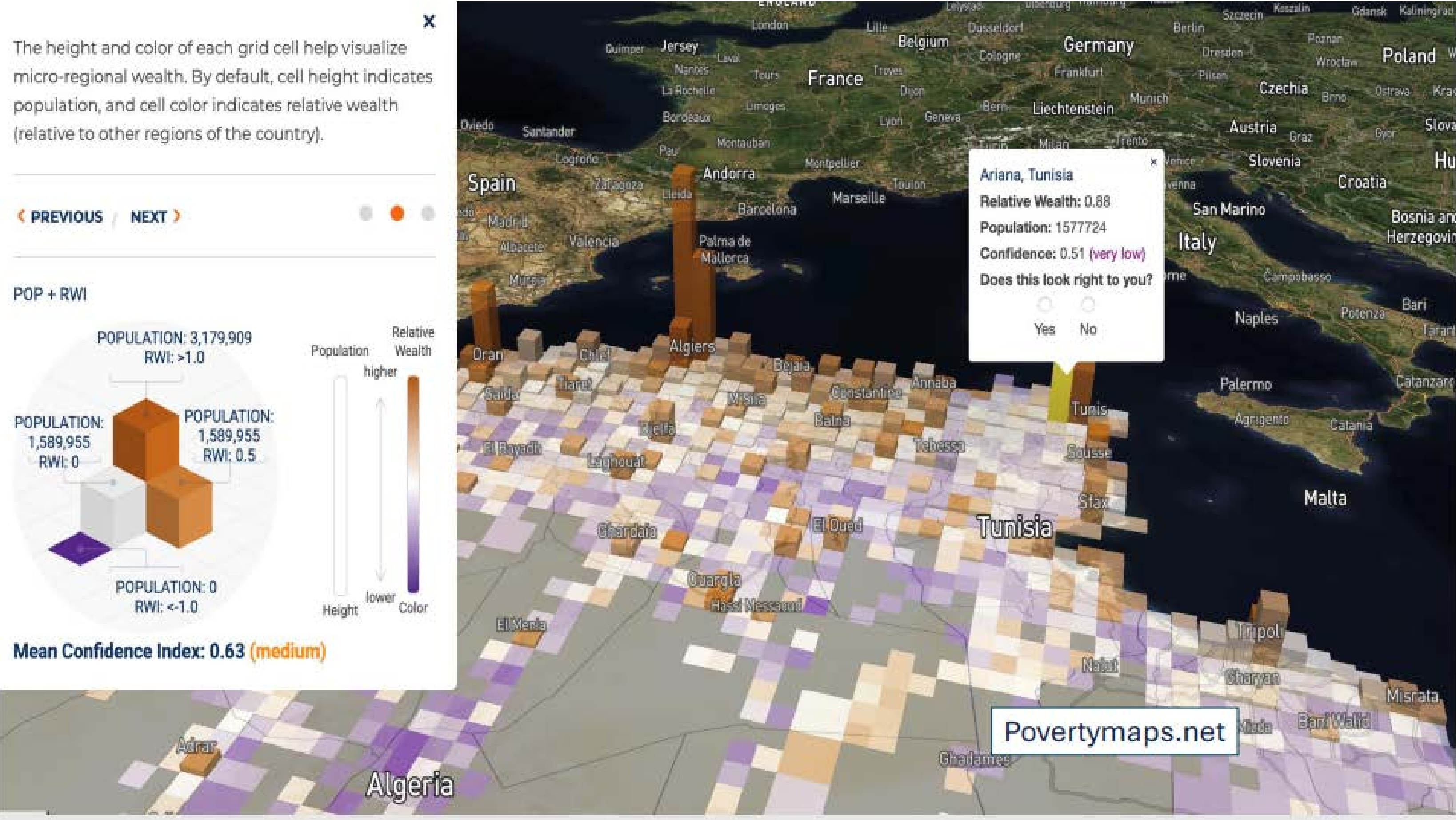
NLPs and ABMs within AI



- AI: Artificial Intelligence
- ML: Machine Learning
- DL: Deep Learning
- NLP: Natural Language Processing
- ABM: Agent-Based Modelling

Case 1:

Using Alternative Data Sources & Generating Missing Data



Learning from new generated data

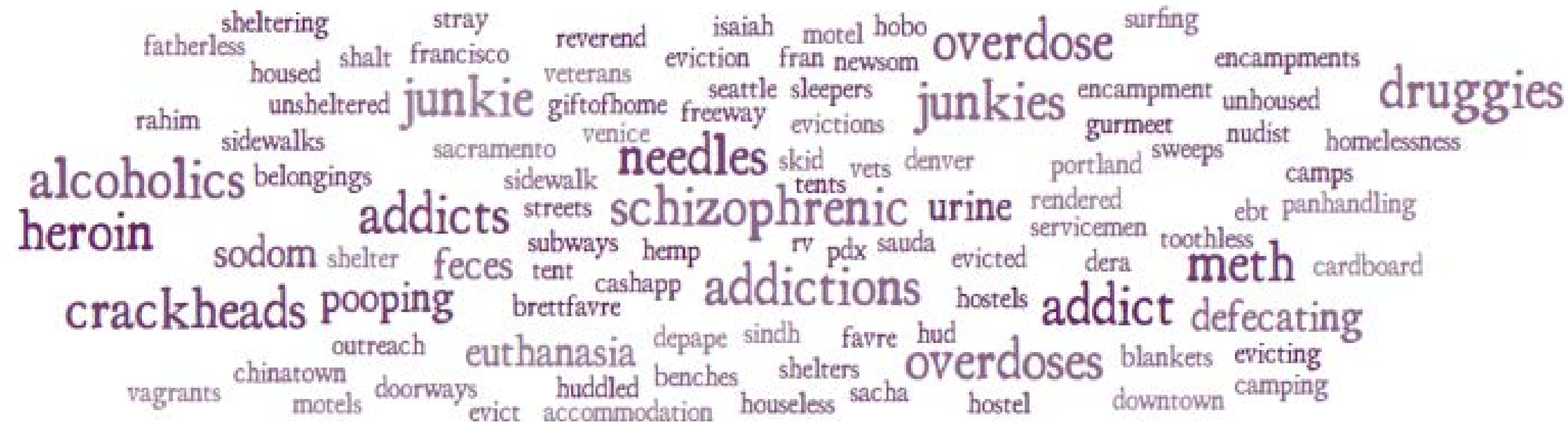


Figure 1: The process diagram for the novel methodology to collect and annotate data.

Data collection

English tweets collected over 3 months (Aug-Nov 2022):

- \mathbf{C}_{poor} : **1.3M tweets** collected with query terms *the poor, poor people, poor folks, homeless, on welfare*, etc.
- \mathbf{C}_{rich} : **1.8M tweets** collected with query terms *the rich, rich people, rich folks, wealthy, upper-class, billionaires*, etc.



Top 100 words with the highest association score

Learning from new generated data

Making every call count: How AI is supporting mothers in India

5 min read

Predictive AI models built with pro bono support from Google DeepMind researchers are helping strengthen maternal health information programs.



Milind Tambe
Director, AI for Social
Good, Google DeepMind



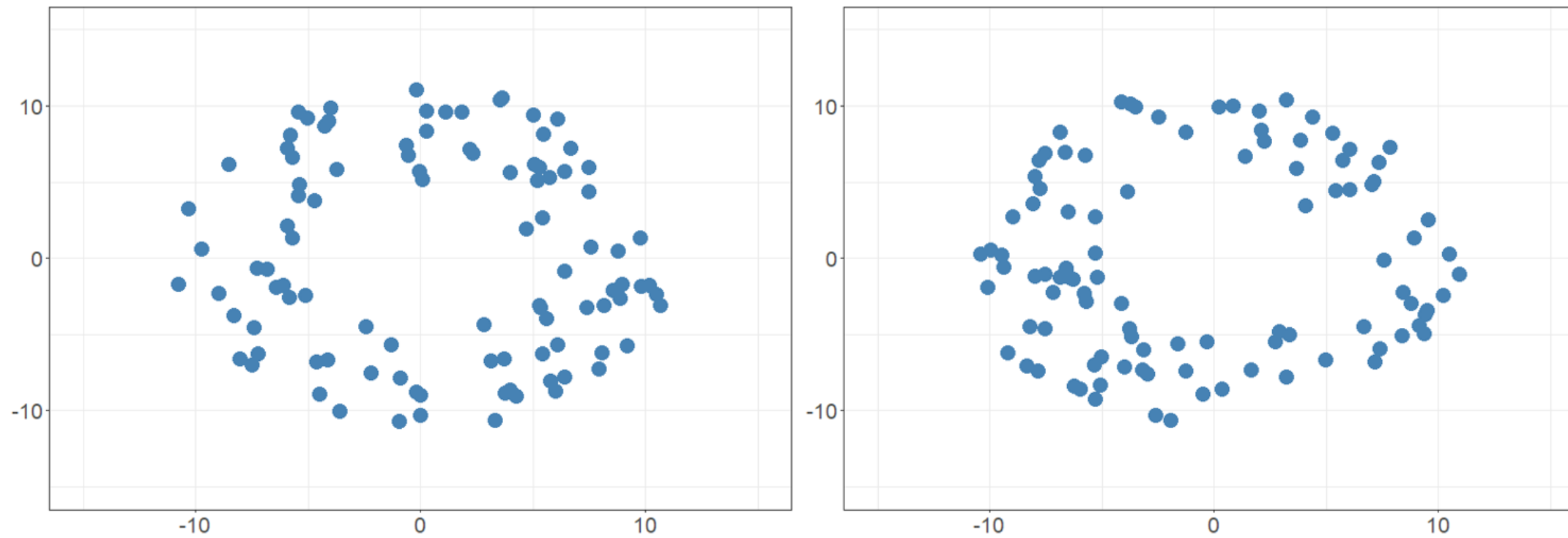
Aparna Taneja
Research Lead for AI for
Maternal Health, Google
DeepMind

[Share](#)



Synthetic Data

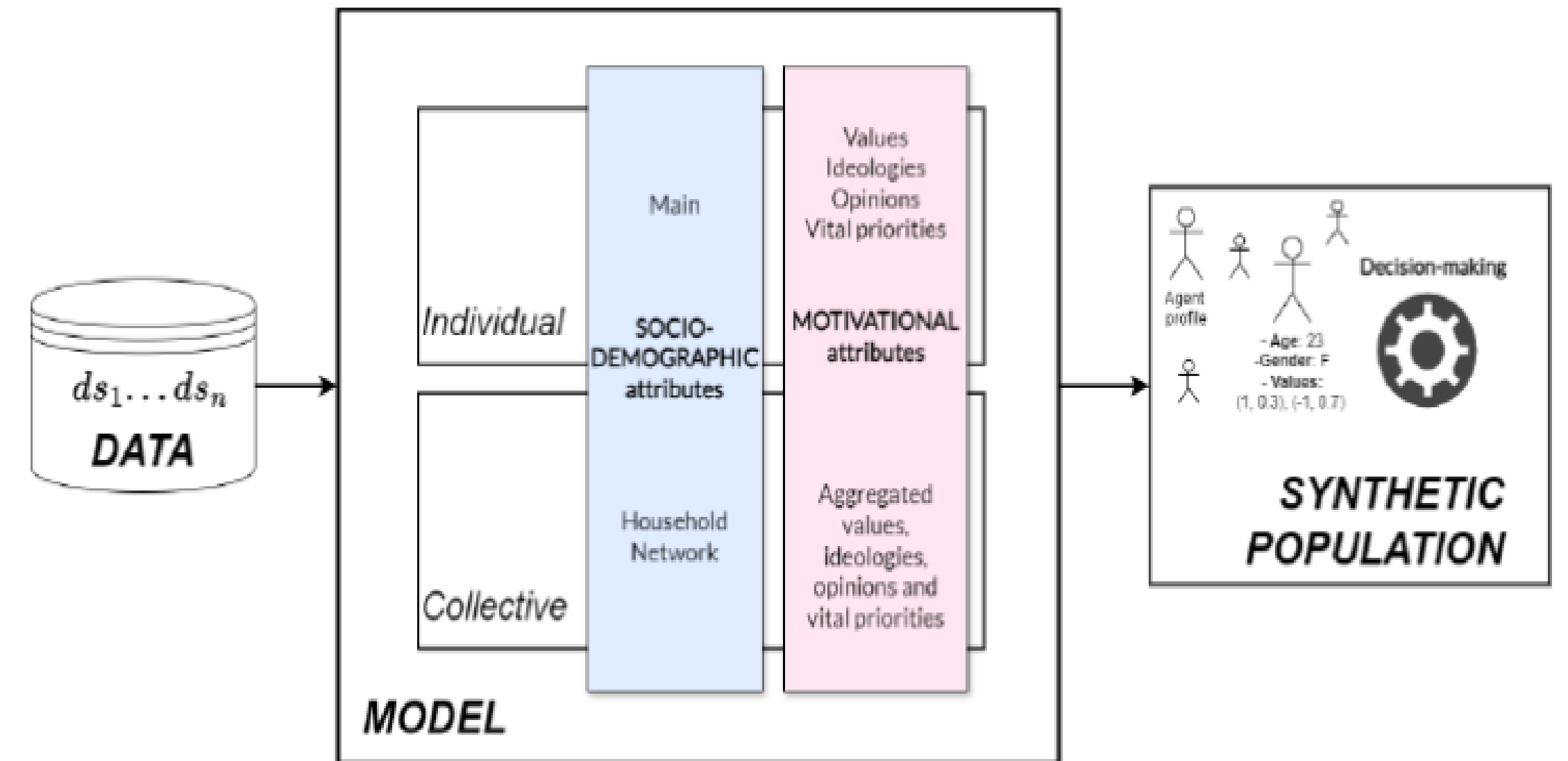
Enriching synthetic datasets



Original data

Synthetic data

The synthetic data retains the structure of the original data but is not the same



Limitations

- Internet access: 35% of people in developing countries and 75% in LDCs have no access.
- Digital illiteracy: 23% of adults internationally.
- Languages: only Arabic and English.
- Annotators biases.

Among other...

Validity vs reliability

Case 2:

Using Alternative Data for AI-Driven Policy Simulation & Modeling

A Policy Laboratory: forward looking decision support system

Forward looking:
“what-if” scenarios

Locally built: AI-
driven **digital twin**

Considering
**behavior &
incentives**

Optimization:
resources, policy
combinations and
sequences

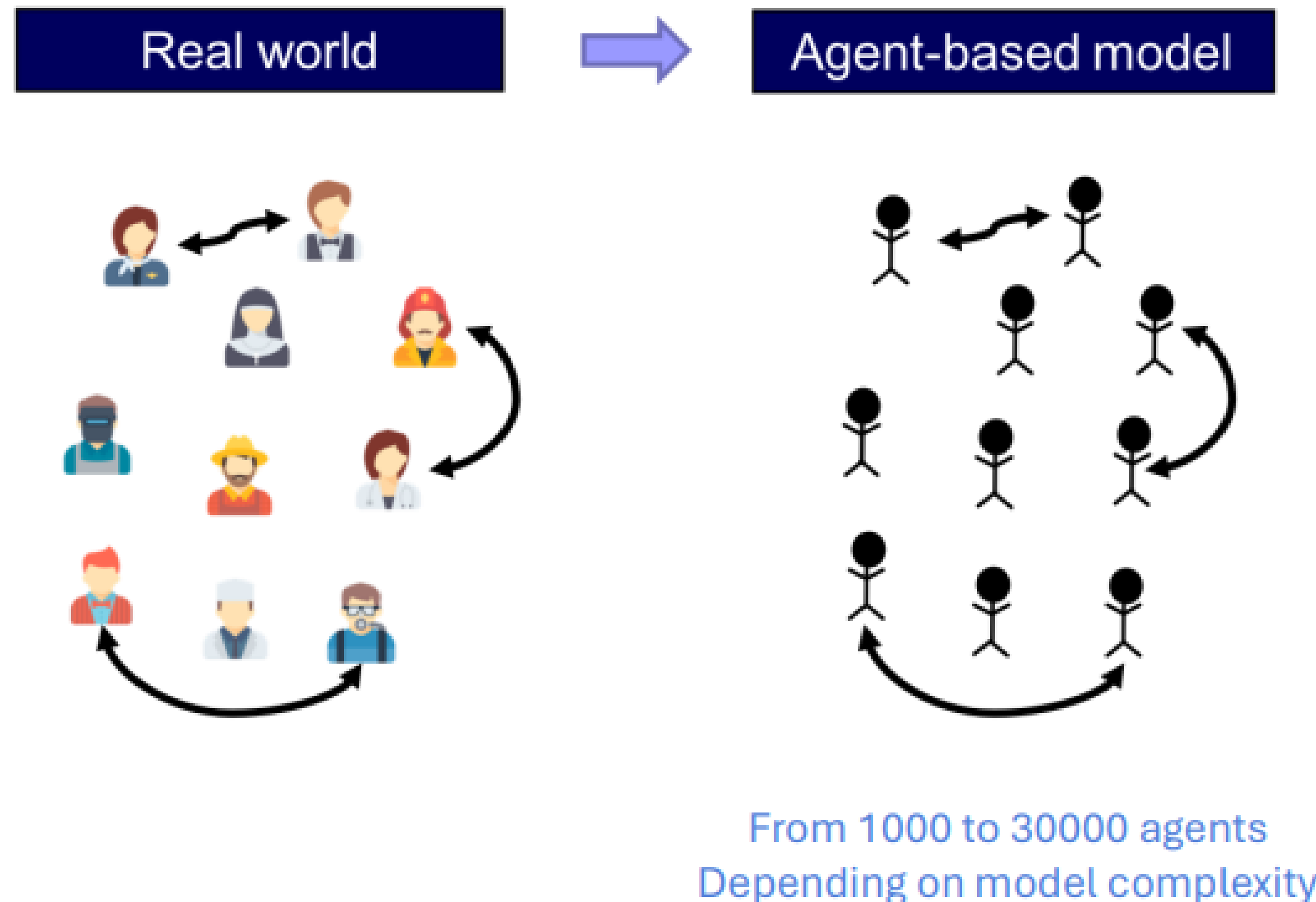
**Non-invasive policy
impact evaluation**
in diversity of
indicators

Risks and **success
rates predictors**

AI Ethics National
and UN ethical
framework

**User-friendly
chatbot for
policymakers**

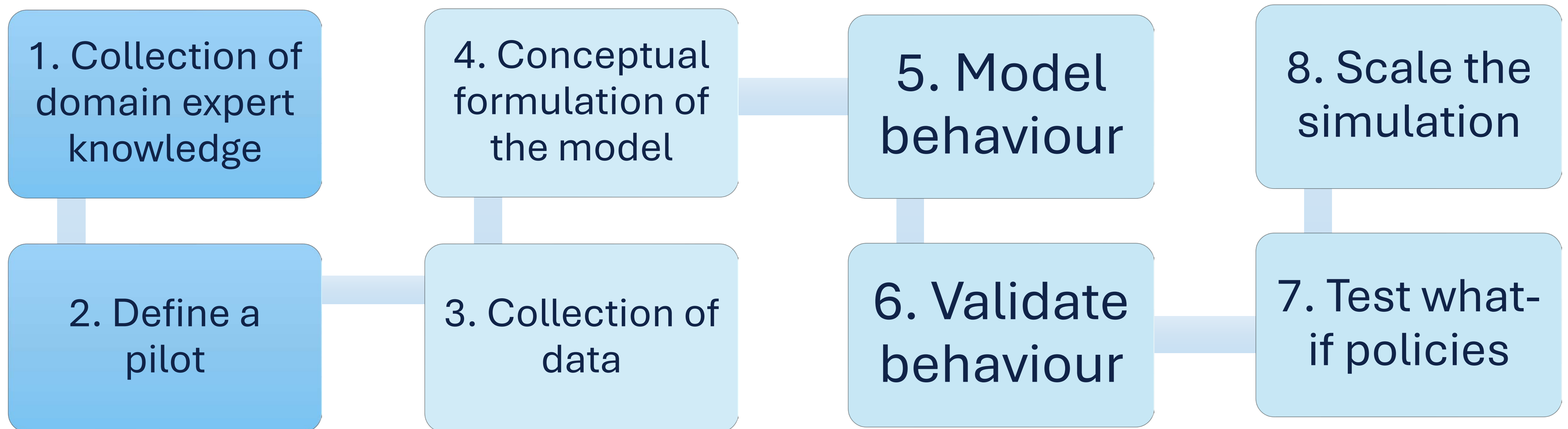
Agent Based Modeling (ABM)



- Focuses on the simulation of real-world entities.
- Agents can represent several concepts: humans, animals, living cells, organizations, etc.
- Used to understand how individual behaviours affect the overall system.

Design, test, refine, evaluate & optimize policymaking options before implementation

High-Level Steps for ABM



The regulatory environment

Reference	[28]
Jurisdiction	National
Attribute	anyone
Deontic	must
Alm	pay fine of 100€ to 600€
Condition	if they misuse public furniture (e.g. sleep on a bench)

Institutional Grammar (Frantz & Siddiki 2021) and Montes & Sierra (2022)

```
3 Rules classified as aporphobic or non-aporphobic with a direct relation with needs or income.
4
5 \item If person A sleeps in the street, then person A gets a fine
6 \item If person A has no income, then person A cannot have a protected home DONE NON.APO
7 \item If person A has no home, then person A cannot obtain a minimum vital income
8 \item If person A has no income, then person A receives a minimum vital income
9 \item If person A has no home, then person A receives a dignified living space within 24 hours DONE NON.APO
10
```

Assumptions:

- all agents are fully aware of the rules and adhere to them.
- the policies are flawlessly implemented.
- the actions of the agents do not influence the selection of policies: no legislative process (e.g. voting) involved.

For example – FII Policies (classified by theme)

Category	Status	Policy	What is the core idea of the policy?	Why is it being implemented/proposed?	Example Countries
Legal Enablers	Existing (pilot scale)	Simplified & Tiered KYC Regulation	Allow opening basic accounts with minimal ID requirements.	Inclusion of rural and low-income populations lacking formal IDs.	Egypt; Jordan
	Existing (implemented)	Movable Collateral & Secured Transactions Law	Accept movable assets (vehicles, stock, tools) as collateral.	Inclusion of women and SMEs without land titles.	Jordan; Saudi Arabia
	Emerging	Alternative Credit Scoring Framework	Use mobile/utility data to build informal credit histories.	Inclusion of unbanked and informal workers.	UAE; Morocco
	Emerging	Flexible / Sharia-Compliant Loan Products	Provide faith-compliant or flexible repayment products.	Inclusion of low-income and religiously constrained users.	Saudi Arabia; Sudan
SME & Microenterprise Finance	Existing	Credit Guarantee Schemes for SMEs & Vulnerable Groups	Public guarantees reduce perceived bank risk.	Inclusion of SMEs and women-led businesses.	Egypt; Jordan
	Emerging /proposed	Inclusive Public Procurement Quota	Reserve public contracts for marginalized SMEs.	Inclusion of SMEs and informal enterprises.	UAE; Tunisia
	Emerging	Interest Subsidy for Inclusive Sectors	Offer lower rates for key sectors (agri, care, green).	Inclusion of targeted SMEs.	Morocco; Egypt
	Emerging	Micro-to-Formal Graduation Pathway	Link microfinance clients to formal banks.	Inclusion of SMEs seeking scale.	Egypt; Yemen
	Existing	Unified MSME Registration & Finance Portal	Simplify business registration and link to finance.	Inclusion of informal SMEs.	UAE; Saudi Arabia
	Emerging	Blended Finance Fund for Inclusive MSMEs	Combine public and private finance to de-risk small firms.	Inclusion of SMEs.	Egypt; IFC regional platforms
Digitalization & Access Infrastructure	Existing	Digital Financial Literacy Program	Train citizens (especially women) in safe digital finance use.	Inclusion of women and digitally inexperienced users.	Egypt; Jordan
	Emerging	Digital Access & Connectivity Subsidies	Expand broadband and reduce data costs.	Inclusion of rural and low-income populations.	Egypt; Morocco
	Existing	Social Protection–Linked Accounts	Deliver welfare via bank or mobile accounts.	Inclusion of low-income populations.	Egypt; Tunisia
Inclusion Targeting	Emerging	Gender & Age-Disaggregated Data Mandate	Require reporting by gender and age.	Inclusion of women and youth (bias visibility).	Morocco; Egypt
		Youth Entrepreneurship Finance Scheme	Targeted credit for young founders.	Inclusion of youth.	Jordan; Egypt
	Existing	Financial Sector Diversity & Leadership Quotas	Promote women’s leadership in financial institutions.	Institutional gender inclusion.	Morocco; Global examples
	Proposed	Care-Economy Credit Incentives	Recognize care/social enterprises as creditworthy.	Inclusion of women and social enterprises.	Egypt
	Emerging	Community / Cooperative Banking Framework	Build community-based savings and lending groups.	Inclusion of rural populations and low-trust communities.	Tunisia; Egypt
	Existing	Refugee & Migrant Account Access Policy	Allow ID exceptions for displaced persons.	Inclusion of refugees and migrants.	Jordan; Lebanon
	Emerging	Assistive Finance Accessibility (PwDs)	Apply accessibility standards to financial services.	Inclusion of persons with disabilities.	UAE; Egypt

Policies – rated by impact and scalability

1. Legal Enablers
2. SMEs
3. Digitalization
4. Target Groups



Rated by impact
and scalability

Set of targeted
policies for the
AI-Simulator

Indicators

The indicators for the Financial Inclusion Index (FII) can be divided in pillars: ACCESS, USAGE and BARRIERS.

ACCESS			USAGE		BARRIERS	
Traditional Infrastructure	Digital Infrastructure (%)	Ease of access to services (%)	Traditional financial op. (%15+)	Digital financial op. (%15+)	Traditional (because)	Digital (why)
n° ATM/1000km2 /100k adults	own mobile phone	owns account/ credit /debit card	made a diposit/ withdrawal	made or received digital payment	insufficient funds	access to electricity
	access to internet/ household with computer	deposit/loan accounts/1kadult	sent or received domestic remittances/ government payments	sent or received domestic remittances using mobile transfer	too expensive	smart phone cost, affordability of mobile data plans
n° bank/1000km2 /100kadults	covered by mobile network, active mobile broadband/100inhabitan ts, fixed-broadband/100 inhabitants, internet bandwidth per internet user (kbps/user)	main source emergency funds in 30 days (loan from bank, employer, private lender)	borrowed/saved from/at a financial institution	borrowed/saved money using mobile money	lack of trust, too far away	digital skills, support for digital literacy, mean years of schooling, government expenditure on education
	<i>using internet for internet banking, e-finance content (user-friendly), government initiative to make wifi available</i>			used mobile phone or the internet to access an account/ to buy something/ to pay bills	lack of necessary documentation	ICT regulatory environment, regulatory quality, cybersecurity, secure internet servers

Indicators

The indicators for the Financial Inclusion Index (FII) can be divided in pillars: ACCESS, USAGE and BARRIERS.

ACCESS			USAGE		BARRIERS	
Traditional Infrastructure	Digital Infrastructure (%)	Ease of access to services (%)	Traditional financial op. (%15+)	Digital financial op. (%15+)	Traditional (because)	Digital (why)
n° ATM/1000km2 /100k adults	own mobile phone	owns account/ credit /debit card	made a deposit/	made a deposit digital		
	access to internet/ household with computer	deposit/loan accounts/1kadult				
	covered by mobile network, active mobile broadband/100inhabitant, fixed-broadband/100 inhabitants, internet bandwidth per internet user (kbps/user)	main source emergency funds in 30 days (loan from bank, employer, private lender)				
n° bank/1000km2 /100kadults						
	using internet for internet banking, e-finance content (user-friendly), government initiative to make wifi available					
				internet to access an account/ to buy something/ to pay bills	lack of necessary documentation	regulatory quality, cybersecurity, secure internet servers

ACCESS data is needed to initialize the simulation.
We will create a virtual map with all the infrastructure.
GRANULAR DATA

Indicators

The indicators for the Financial Inclusion Index (FII) can be divided in pillars: ACCESS, USAGE and BARRIERS.

ACCESS			USAGE	
Traditional Infrastructure	Digital Infrastructure (%)	Ease of access to services (%)	Traditional financial op. (%15+)	Digital financial op. (%15+)
n° ATM/1000km2 /100k adults	own mobile phone	owns account/ credit /debit card	made a deposit/	made a processed digital
	access to internet/ household with computer	deposit/loan accounts/1kadult	sen	
	covered by mobile network, active mobile	main source	cor	
n° bank/1000km2 /100kadults	broadband/100inhabitan	emergency funds in	gov	
	ts, fixed-broadband/100	30 days (loan from		
	inhabitants, internet	bank, employer,		
	bandwidth per internet	private lender)		
	user (kbps/user)			
	using internet for internet banking, e-finance content (user-friendly), government initiative to make wifi available			

Additionally, we need demographic data for the synthetic population.
DISAGGREGATED DATA

For the Individuals/Households	Personal	Gender Age Income Level Household Structure Marital Status Area Type Migration Status Employment Status Occupation sector Education Level	F/M/other Age group Income group single mom with 2 children / married mom with 3 children single/ married / widowed / divorced Urban/ Rural Native /Internal Migrant/refugee Unemployed/ caregiver / formal employee / informal employee agriculture, manufacturing, retail trade, public service Highest degree completed
	Financial	Digital literacy Trust in financial institutions account ownership/ credit or debit card main source of emergency funds wealth	low, medium, high low, medium, high none, wallet, bank account savings / family or friends / formal loan / none money and assets based on statistical income and wealth
	Infrastructural	internet access smartphone ownership household with computer mobile network coverage min. distance to banking agent	none / wifi / mobile / both yes / no yes / no none / 2G-5G
For the Firms		Size of firm Formality Sector Workforce composition average digital literacy	entrepreneur, micro , small, medium, large informal / formal agriculture, manufacturing, retail trade, public service number of employees, female workers, youth workers low, medium, high
For the Financial Service Providers		Provider type Clients Target costumer segments Digital capabilities Product mix Network of banking agents Bank status Pricing and fees	bank, mfi credit only, mfi deposit taking, insurer, List of active clients salaried micro SMEs women youth rural refugee remote onboarding, ussd, mobile app, instant payments savings, credit, payments, merchant_acquiring, insurance List of associated banking agents, capacity and location Liquidity, profit status, etc. p2p fee, merchant MDR, loan interest, account month
For the Financial Support Providers		supporter type target cohort selection criteria budget	NGO incubator accelerator VC angel DFI women youth rural refugees informal_workers do they prioritize vulnerable groups, promising entrepreneurs small(<100k) medium(100k-1m) large(>1m)

Indicators

The indicators for the Financial Inclusion Index (FII) can be divided in pillars: ACCESS, USAGE and BARRIERS.

ACCESS			USAGE		BARRIERS	
Traditional Infrastructure	Digital Infrastructure (%)	Ease of access to services (%)	Traditional financial op. (%15+)	Digital financial op. (%15+)	Traditional (because)	Digital (why)
n° ATM/ /100k ad			made a diposit/ withdrawal	made or received digital payment	insufficient funds	access to electricity
			sent or received domestic remittances/ government payments	sent or received domestic remittances using mobile transfer	too expensive	smart phone cost, affordability of mobile data plans
n° bank/10 /100kad			borrowed/saved from/at a financial institution	borrowed/saved money using mobile money	lack of trust, too far away	digital skills, support for digital literacy, mean years of schooling, government expenditure on education
				used mobile phone or the internet to access an account/ to buy something/ to pay bills	lack of necessary documentation	ICT regulatory environment, regulatory quality, cybersecurity, secure internet servers

USAGE and BARRIERS data is needed to define the agents' behaviour.

We can validate the baseline existing behaviour.

DISAGGREGATED DATA

Agents

1. Government and central bank
2. Banks and other microfinance institutions
3. Non-profits for development, venture capitalist, incubators or accelerators.
4. SMEs and Entrepreneurs
5. Individuals and Households

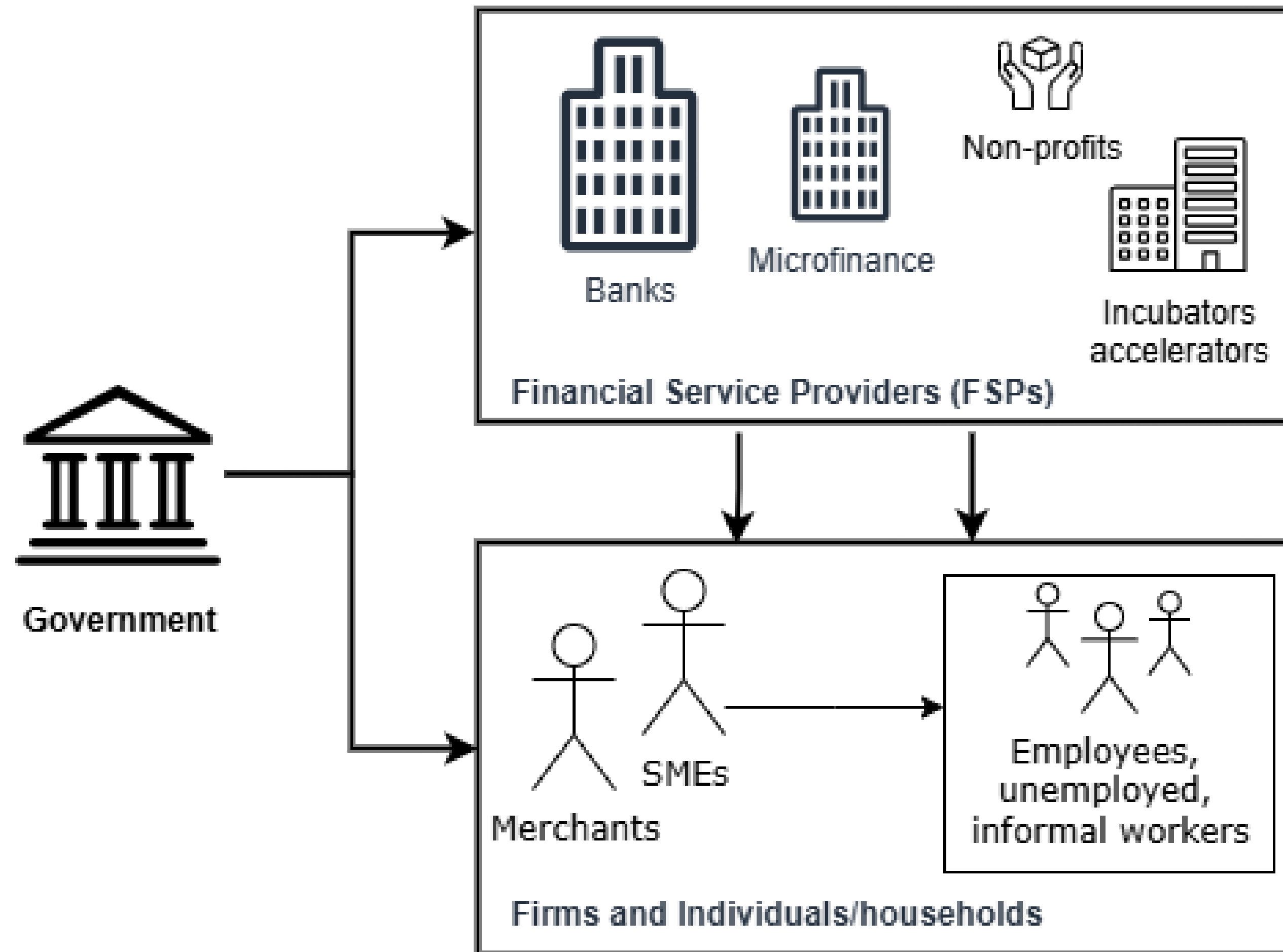
Agent Type	Agents	Description	Role	Possible actions
Policy-makers	Government	Executive/ministries (finance, ICT, social protection, ID/civil registry).	Legal regulator	Set legal rules: KYC/e-ID; wallet eligibility (incl. non-nationals); digitize G2P & public payroll; fast cash flow; build national e-ID/public Wi-Fi spots; credit guarantees Set prices: cap MDR/fees Invest: fund agent-network expansion
	Central Bank	Supervisor of FSPs.	Financial regulator	Set financial rules: License/supervise banks, MFIs, EMIs/PSPs; define tiered KYC & remote onboarding; Set prices: set basic account standards/fee caps; set card/QR fees between providers and to merchants; Invest: provide funding lines to banks/MFIs.
Financial Service Providers (FSPs)	Bank	Distributor of deposits, loans, payments, savings/insurance.	Financial intermediary	Onboard (remote/branch); offer basic no-min accounts; build/contract agents (local shops as cash-in/cash-out points) Provide loans: with or without public guarantees; Manage agents; recruit shops, ensure cash/e-float.
	Microfinance institutions (MFIs)	Distributor of deposits, loans, payments, savings/insurance for low-income/informal & micro/SMEs.	Microfinance intermediary	Onboard (via agents/USSD); link SMEs to banks when they want to scale. Provide micro-loans: micro-loans & micro-insurance; group lending; social collateral; Act as banking agents (where allowed), collect payments, Coaching: digital literacy, banking literacy, enterprise literacy.
Financial Support Providers	Non-profits for development (NGOs)	Implementers/enablers (not licensed FSPs) focused on inclusion and MSMEs.		Provide grants/stipends to accounts; matched savings; give guarantees or share first-loss facilities so that FSPs can serve riskier clients, link to banks/MFIs when they want to scale. Coaching: digital literacy, banking literacy, enterprise literacy with gender/rural/youth focus.
	Venture capitalists & business angels	Equity investors in high-growth startups (fintech, merchant tech, MSME tools).		Invest: link to banks/FSPs; Coaching: mentorship/governance; promote fintech;
	Incubators & accelerators	Programs that make founders "bankable/investable."		Invest: micro grants, link to FSPs/VCs. Coaching: mentorship/governance; promote fintech;

Agents

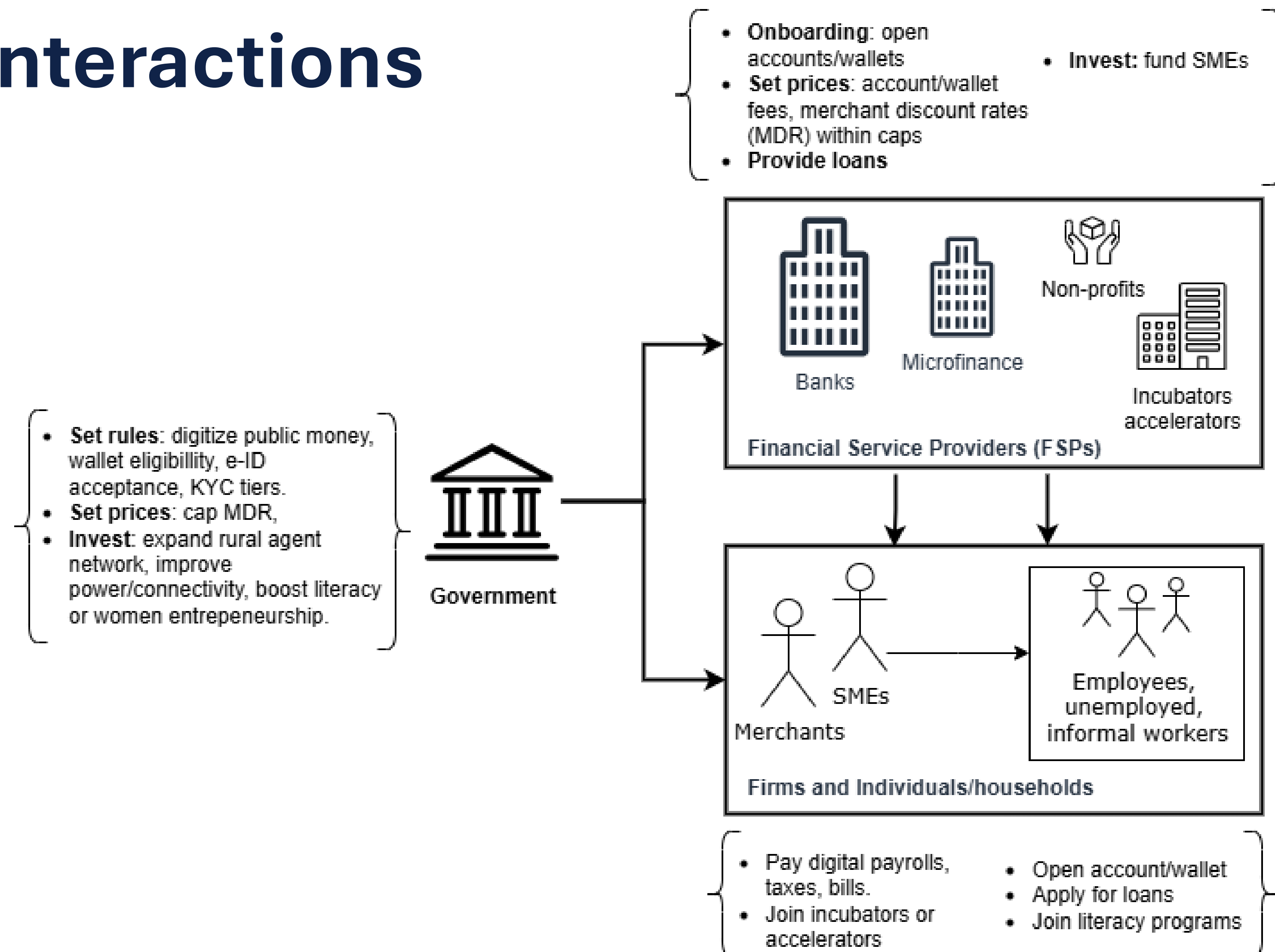
1. Government and central bank
2. Banks and other microfinance institutions
3. Non-profits for development, venture capitalist, incubators or accelerators.
4. **SMEs and Entrepreneurs**
5. **Individuals and Households**

Firms	SMEs	Formal/informal small & medium non-financial firms; many are merchants and/or employers.	FS user and private job production	Open account/wallet; Register (formalize) Accept payments Pay: pay wages (digital/cash), adopt QR/USSD/POS; choose settlement terms; keep-digital vs cash-out; Take loans (guarantees, factoring/e-invoicing); public procurement; join incubators. Join financial/digital literacy;
	Entrepreneurs	Self-employed/early-stage firms; often informal and women- or youth-led.	FS user and entry point to SME	Open account/wallet; Register (formalize) Accept payments Take micro-loans; micro-credit; savings/insurance; join training/incubation Join financial/digital literacy;
Individual/Households	Employees	Wage earners in formal firms; are paid in cash or digitally.	FS user and private/public worker	Open account/wallet; Use banking agents; Pay merchants (QR/USSD/POS) and bills; cash-out vs digital; P2P/remittances; auto-savings and micro-insurance; Apply for micro-credit/overdraft; Join financial/digital literacy;
	Informal workers	Wage earners in informal firms, unemployed, self-employed, day labor, street vendors;	Potential FS user	Open account/wallet; Register (formalize) Use banking agents; Pay taxes/contributions, Accept payments (QR/USSD); Apply for micro-loans (incl. group lending/social collateral); join savings groups; pay taxes/contributions digitally; receive G2P/remittances; micro-insurance;

Agents - Interactions



Agents - Interactions



Simulating packages of policies

```
22 sorted_combinations = sorted(gini_coefficients, key=lambda x: x[1])
23
24 for combination, gini_coefficient in sorted_combinations:
25     print(f'Combination: {combination}    Gini Coefficient: {gini_coefficient:.6f}')
26
```

✓ 0.3s

Combination: (0, 1, 5) Gini Coefficient: 0.408521
Combination: (0, 1, 4, 5) Gini Coefficient: 0.411436
Combination: (0, 1) Gini Coefficient: 0.411724
Combination: (0, 4) Gini Coefficient: 0.414345
Combination: (0, 2) Gini Coefficient: 0.418287
Combination: (0, 4, 5) Gini Coefficient: 0.418836
Combination: (0,) Gini Coefficient: 0.420951
Combination: (0, 5) Gini Coefficient: 0.423511
Combination: (0, 1, 2, 5) Gini Coefficient: 0.423935
Combination: (0, 1, 4) Gini Coefficient: 0.424874
Combination: (0, 1, 2) Gini Coefficient: 0.427908
Combination: (0, 2, 5) Gini Coefficient: 0.431453
Combination: (0, 2, 4, 5) Gini Coefficient: 0.437780

100 agents

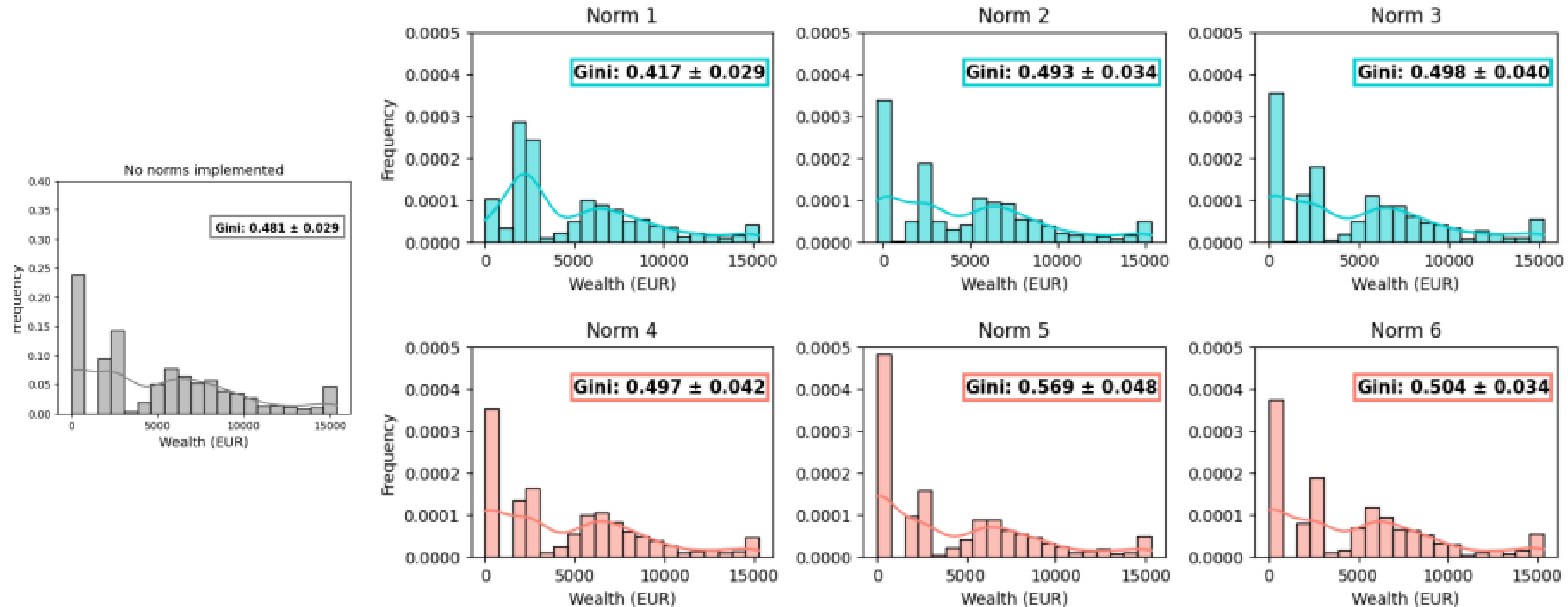
4 months agents' activity

6 norms

64 norms combinations

640 simulations

Measuring outputs (indicators)



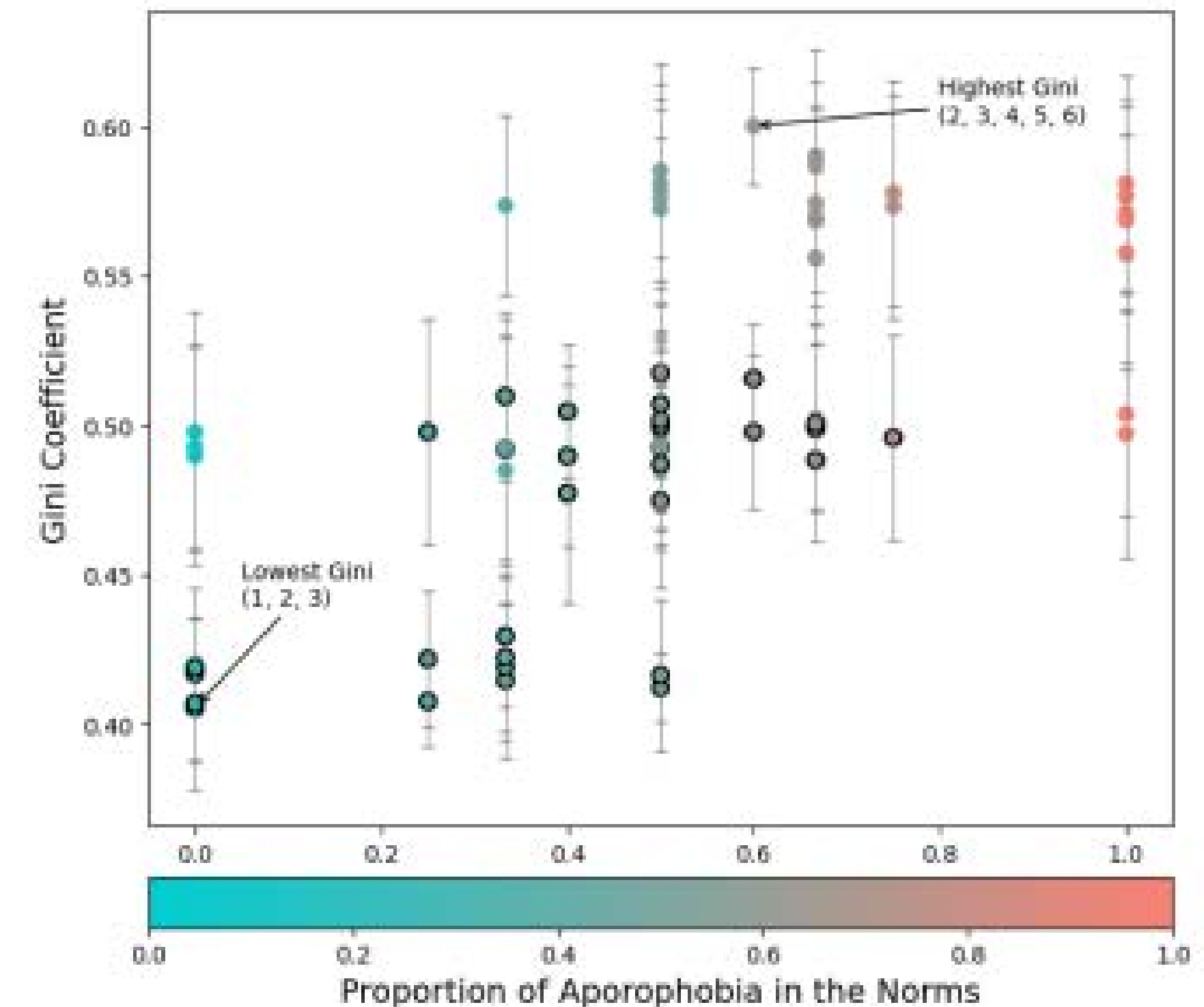
Policy optimization

Policies

Tag	Norm (Id)	Description
Non-Apo	(1)	Receive unemployment benefits if you have fulfilled the required contributions when a month has gone by.
	(2)	Receive minimal vital income when a month has gone by.
	(3)	Receive a dignified living space in case of being homeless when a month has gone by.
Apo	(4)	Pay a fine when you sleep on the street or commit a minor crime.
	(5)	In case you can not pay the fine for a crime, the fine can be commuted to days of imprisonment.
	(6)	Evicted from your home in a bankruptcy situation when a month has gone by.

AABM
executions

Results



LLMs Agent-Based Models



Source: Joon Sung Park, et al. *Generative Agents: Interactive Simulacra of Human Behavior*. 2023

LLMs-Based Agents Can Be Used to Simulate Human Behavior

- Large language models (GPT-4) serve as the brains for NPCs in game environment similar to SIMS franchise.
- Agents were given a short biography consisting of a name, age, job, family, interests, and a few habits.
- Agents then behave like humans in the game.

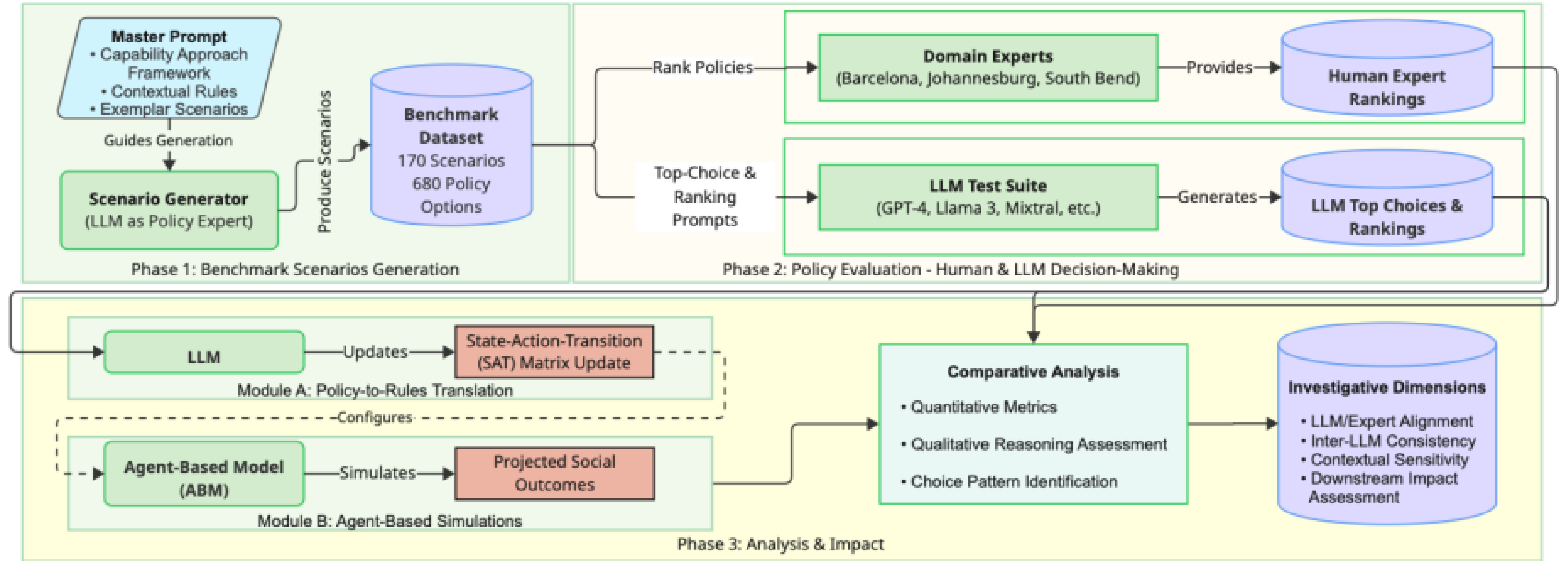


Figure 1: Methodology overview: we construct a benchmark via a structured prompting strategy grounded in the Capability Approach, prompt various LLMs to act as policymakers, and analyze their choices through comparison with human expert judgments and a study of their projected societal impact using a modular agent-based modeling pipeline.

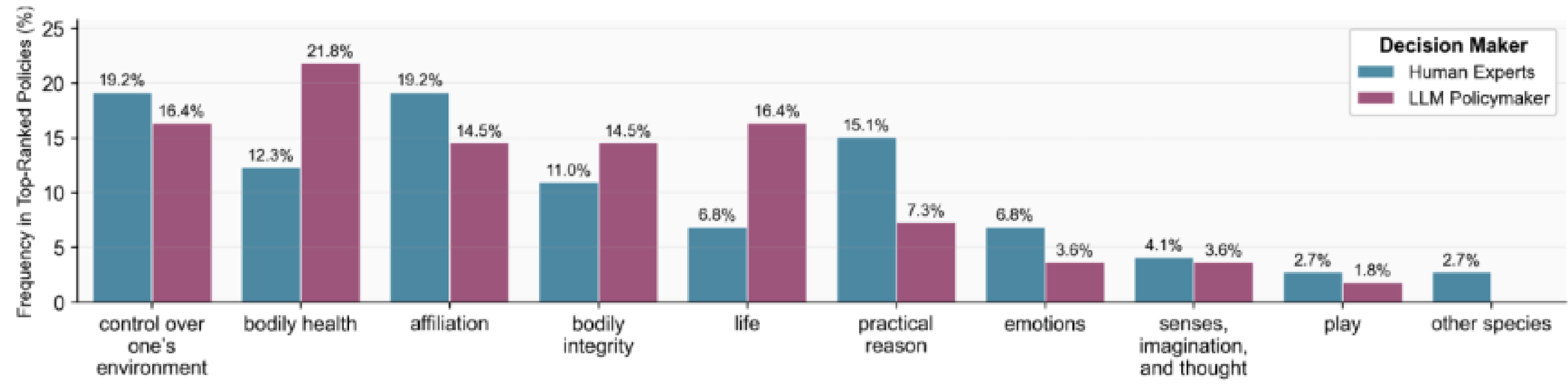


Figure 3: Comparison of capabilities prioritized in the top policy choices of human experts and GPT-4.1 across all scenarios.

Table 2: Comparison of how policies recommended by LLMs and experts fulfill the needs of PEH agents in the simulation.

Scenario	Physiological			Safety			Belonging			Self-esteem		
	Mean	Std.	p-value	Mean	Std.	p-value	Mean	Std.	p-value	Mean	Std.	p-value
Scenario 1												
LLM Policy	+0.019	-0.005	0.001	+0.032	-0.023	0.001	+0.021	-0.008	0.030	+0.037	-0.025	0.001
Expert Policy	-0.004	-0.004	0.457	+0.026	-0.023	0.006	-0.036	-0.011	0.009	+0.027	-0.025	0.015
Scenario 3												
LLM Policy	+0.012	-0.010	0.080	+0.031	-0.025	0.001	+0.012	-0.013	0.302	+0.036	-0.027	0.001
Expert Policy	+0.011	-0.011	0.029	+0.030	-0.025	0.001	+0.009	-0.017	0.092	+0.035	-0.028	0.001
Scenario 5												
LLM Policy	+0.014	-0.020	0.134	+0.031	-0.026	0.002	+0.014	-0.034	0.322	+0.038	-0.030	0.002
Expert Policy	+0.002	-0.020	0.909	+0.029	-0.025	0.002	-0.016	-0.032	0.036	+0.033	-0.029	0.003

Home-grown LLMs (local language & culture)



Home / Resources / News / Meet Jaïs, The World's Most Advanced Arabic LLM Open Sourced By G42'S Inception

MEET JAIS, THE WORLD'S MOST ADVANCED ARABIC LLM OPEN SOURCED BY G42'S INCEPTION



Falcon Arabic:
Smarter Language
AI for Arabic
Speakers
Everywhere

فَنَار

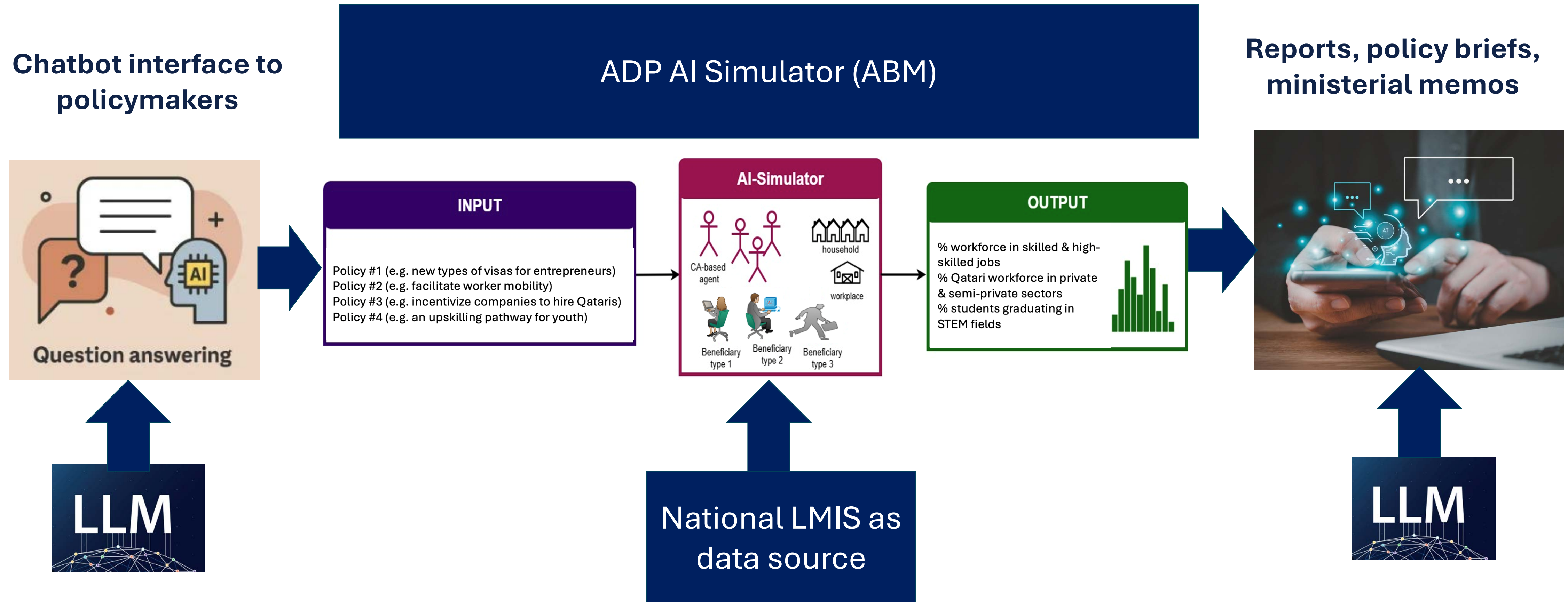
مشروع الذكاء الاصطناعي العربي

النسخة التجريبية

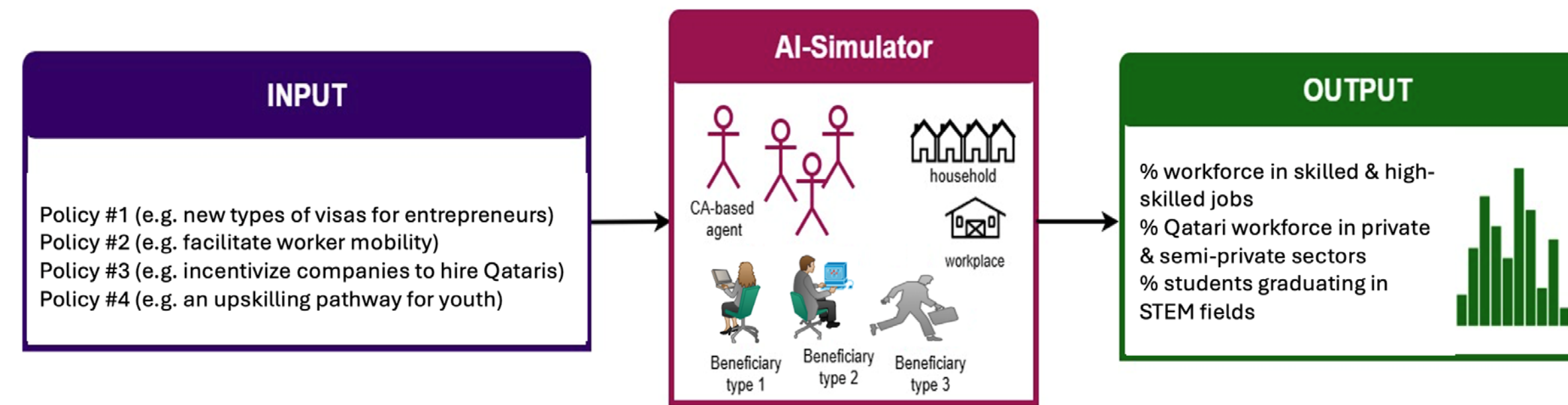
فَنَار هو نموذج ذكاء اصطناعي توليدي باللغة العربية تم تطويره من قبل معهد قطر لبحوث الحوسبة في جامعة حمد بن خليفة، عضو مؤسسة قطر للتربية والعلوم وتنمية المجتمع، تحت رعاية من الحكومة القطرية عبر وزارة الاتصالات وتكنولوجيا المعلومات. يمثل فَنَار إنجازاً متقدماً في مجال الذكاء الاصطناعي المرتبط باللغة والثقافة العربية، وبجسد رؤية قطر الوطنية 2030 ويتمشى مع ركائز الأجندة الرقمية 2030.

تحدث مع فَنَار

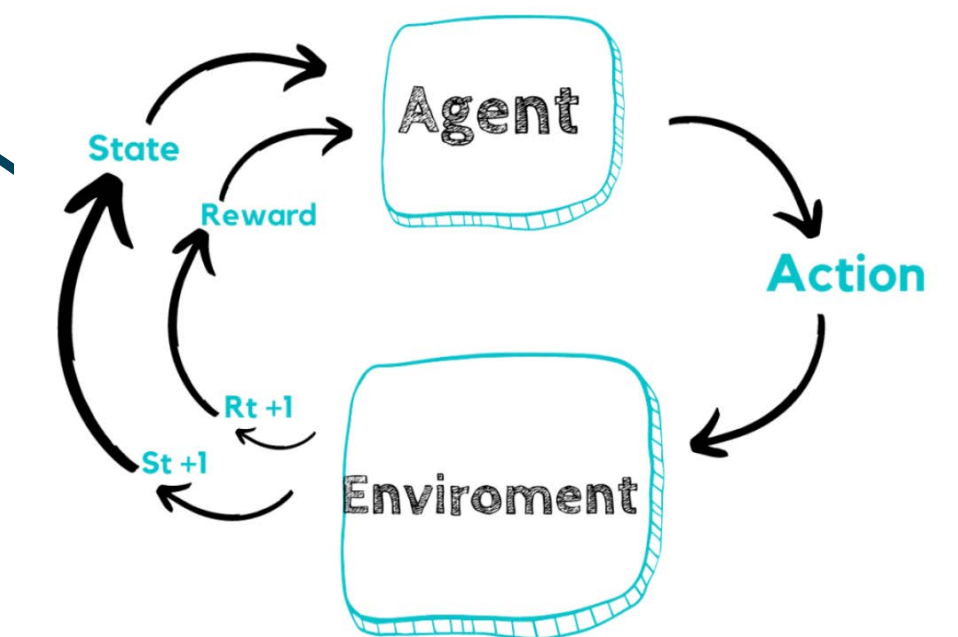
Another example of purposely-built tool for labour market policymaking



Rooted in conceptual frameworks, economic theory, policy considerations & relevant constraints



ABM: simulating policy packages the what-if

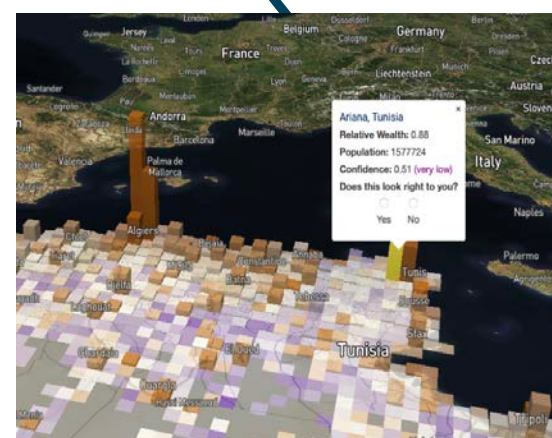


Reinforcement learning: policy optimization

The engine: AI for labour market policymaking



NLP: identifying the barriers the why



Geospatial and synthetic: when no data is available



Locally encoded AI Ethics



**Interface to policymakers
Enriching and automating**