



Artificial Intelligent for Assessment

AI FORA
artificial intelligence for assessment



VolkswagenStiftung

TISS LAB
Technology & Innovation Sociology / Social Simulation Laboratory


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Outlines

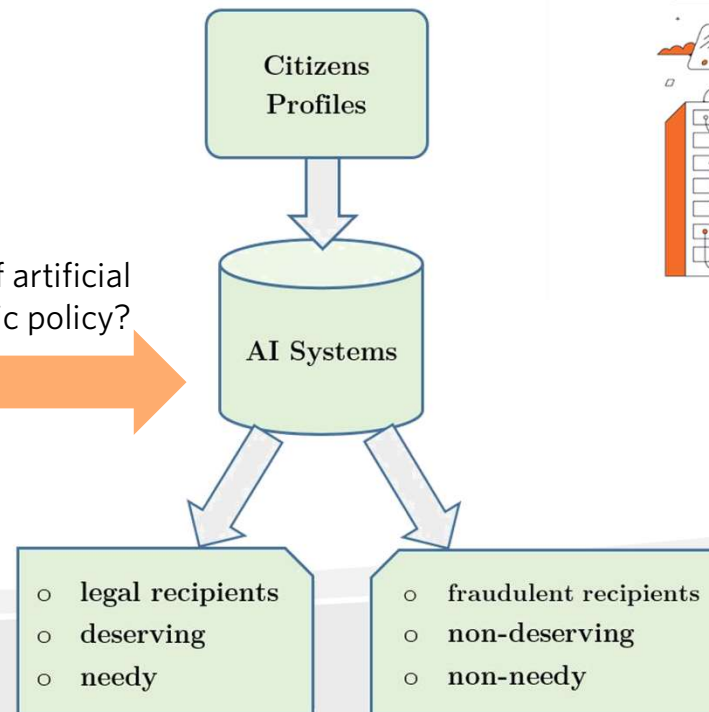
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Problem Statement

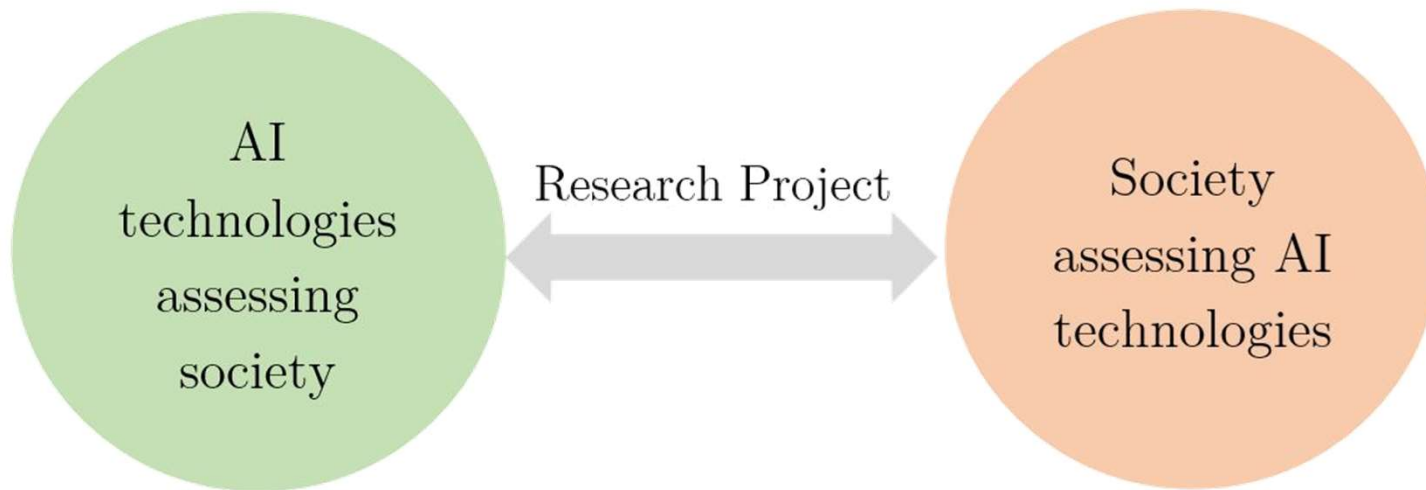
- Human society has become a socio-technical system using artificial intelligence (AI) technology.

values, norms,
state of technology development,
economic models,
civil society sentiments,
legislative, executive, and
judicial characteristics vary
from country to country

acceptance of the use of artificial
intelligence for public policy?

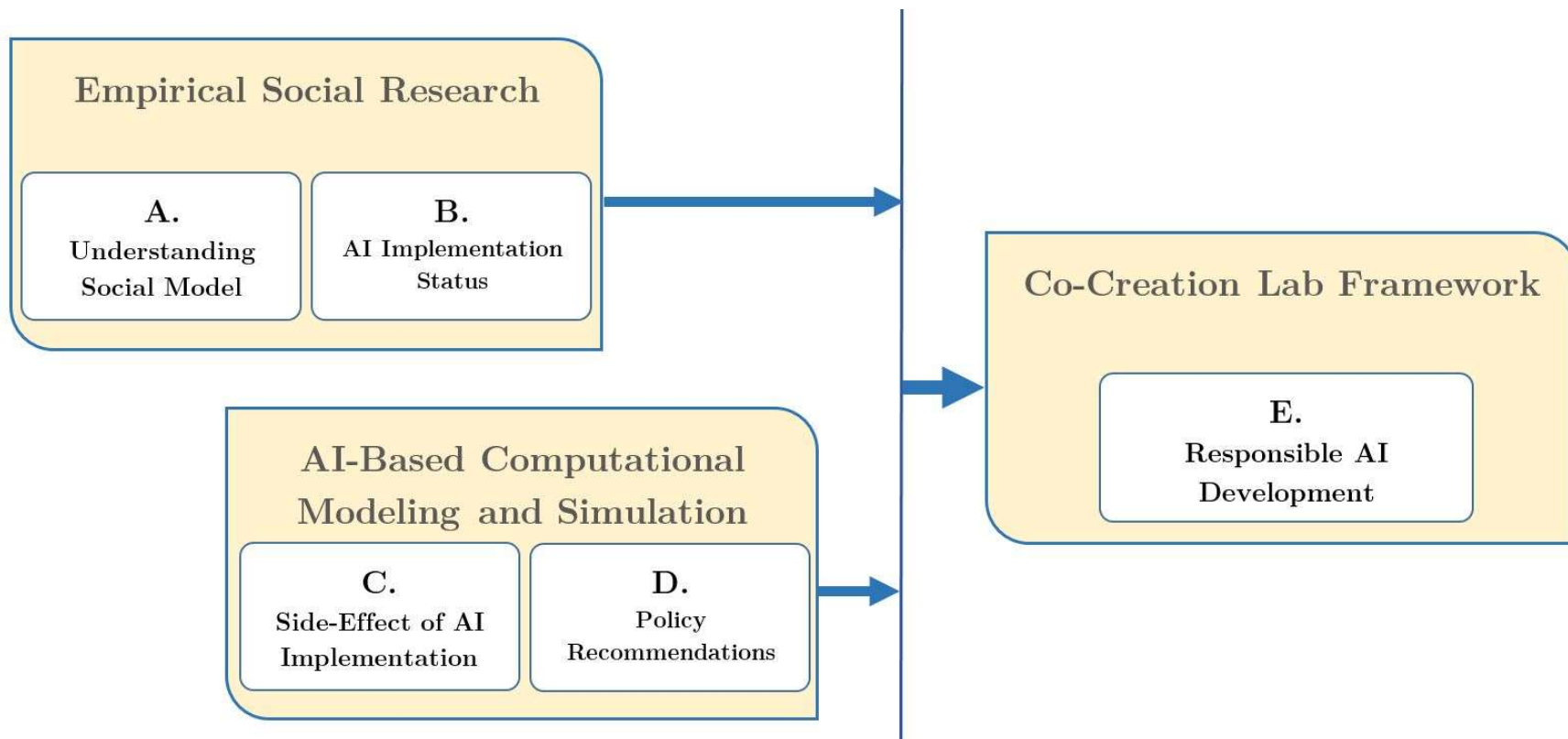


Problem Statement (Continue)



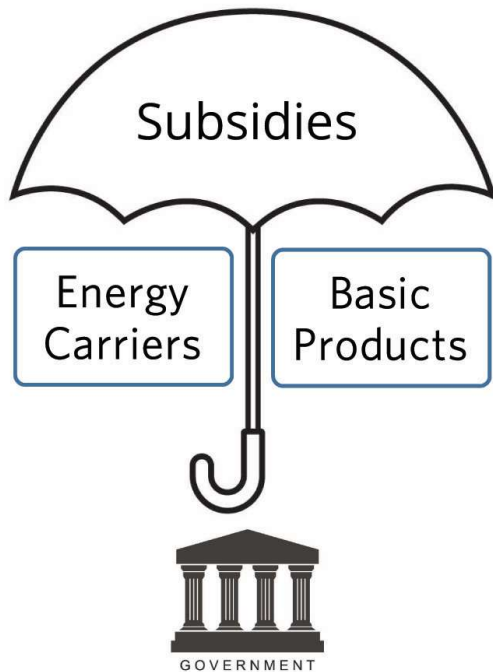
The **project's objective** is to understand **the status quo** and **the future options** of **AI-based social assessment in public service provisions** to help in creation of **improved AI technology for social welfare systems**

Research Phases and Methodology

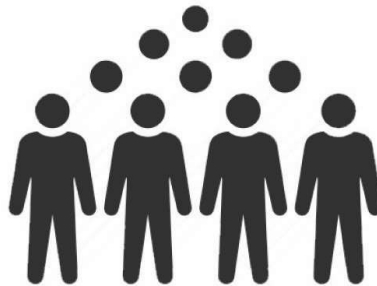


Iran as a Case Study: Targeted Subsidies Plan

Manufacturers and service providers



Citizens



More consumption means more use of government subsidies



Problem is here that the more consumption means more use of government's subsidies. The richer you are, the more you benefit from subsidies.

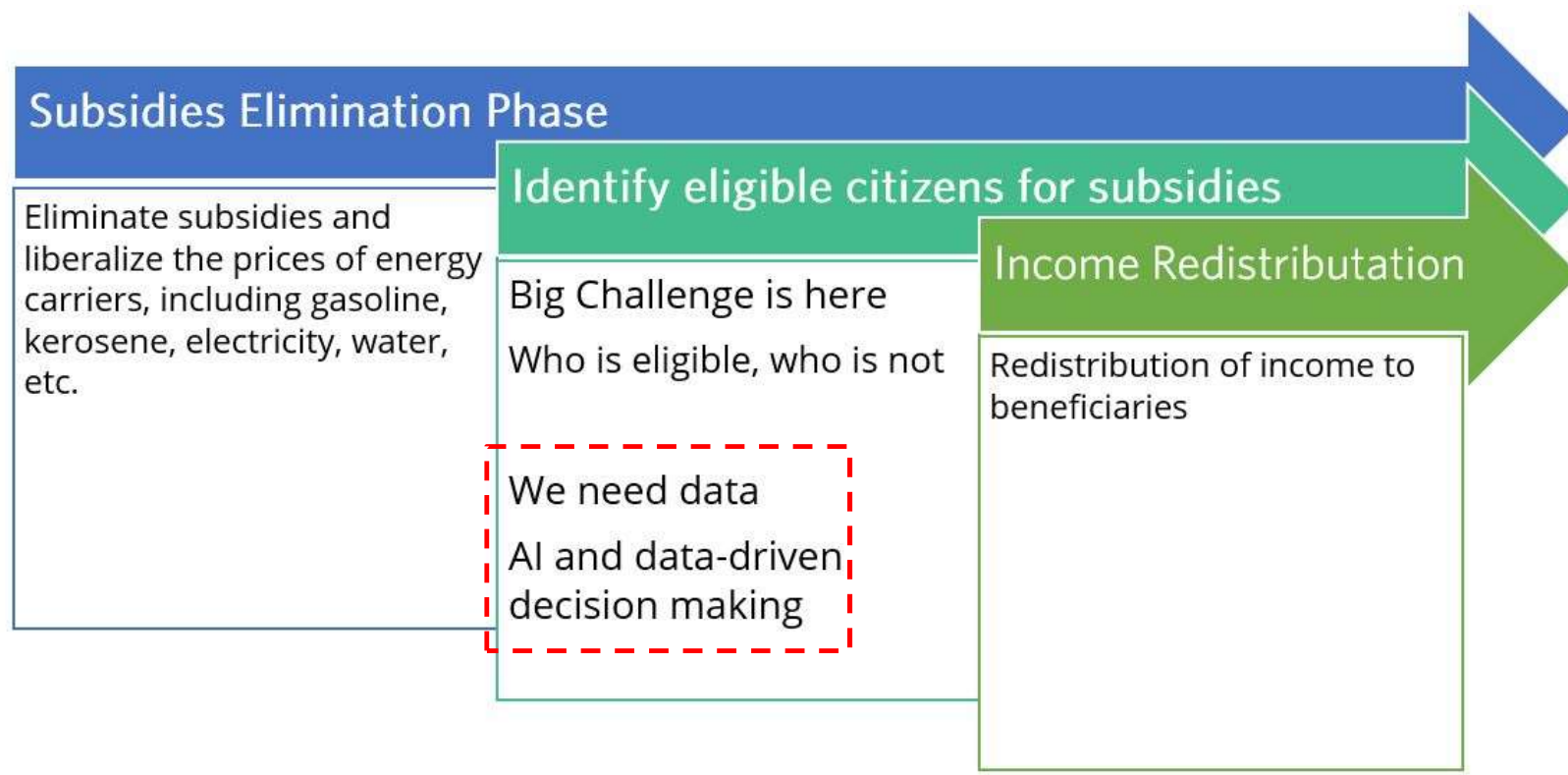


Targeted Subsidies Plan (TSP)

- The largest project in the history of Iran's economy
- Approved by the parliament in the beginning of the 2010 and launched by the government since the end of 2010
- **Pillar 1:** Elimination of subsidies and liberalization of prices of **energy carriers**, including gasoline, kerosene, electricity, water, etc.
- **Pillar 2:** Redistribution of revenues from eliminating indirect subsidies and price liberalization.
- **Critical activity:** **Identify eligible households.**



Targeted Subsidies Plan (Continue)

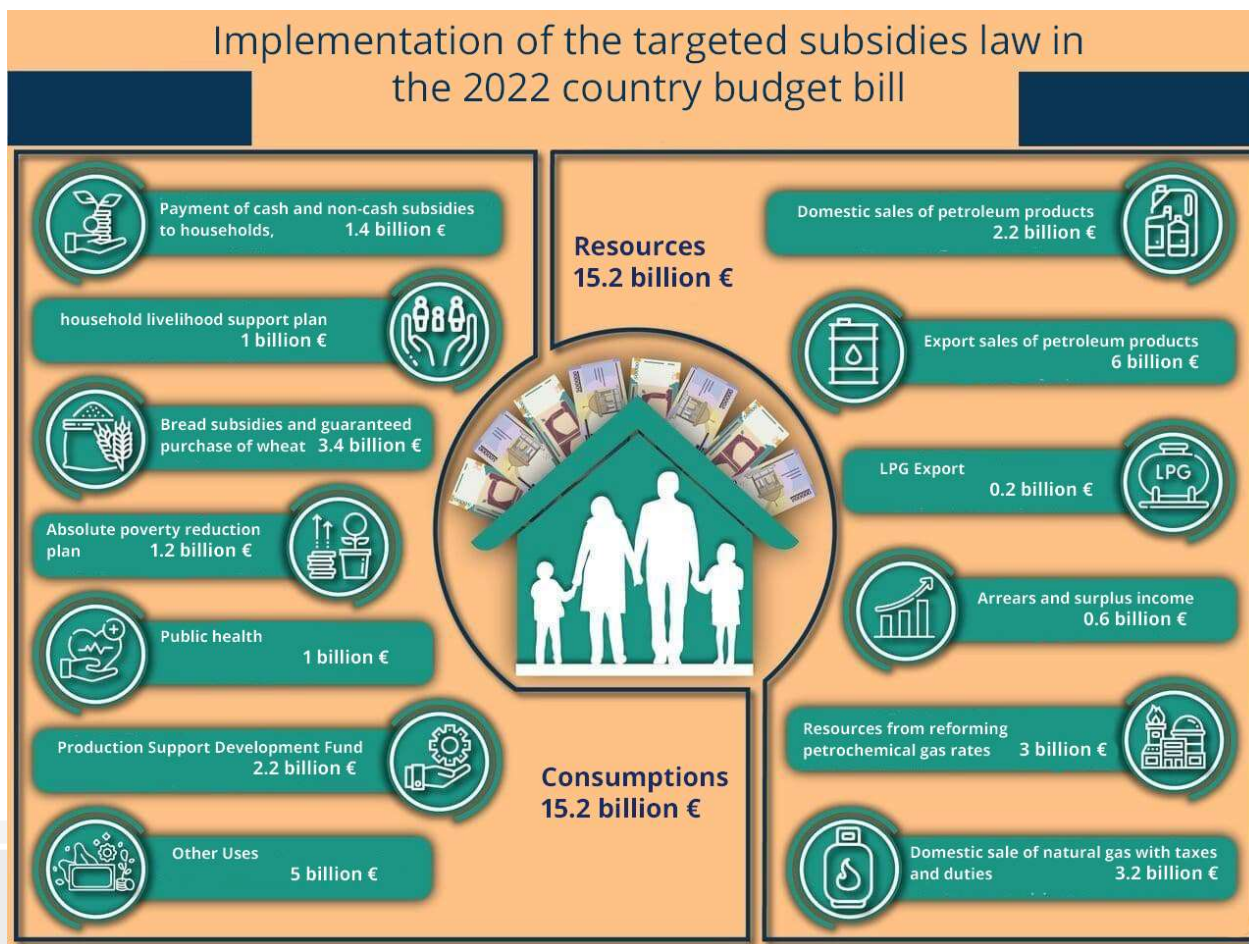




Summary of the law

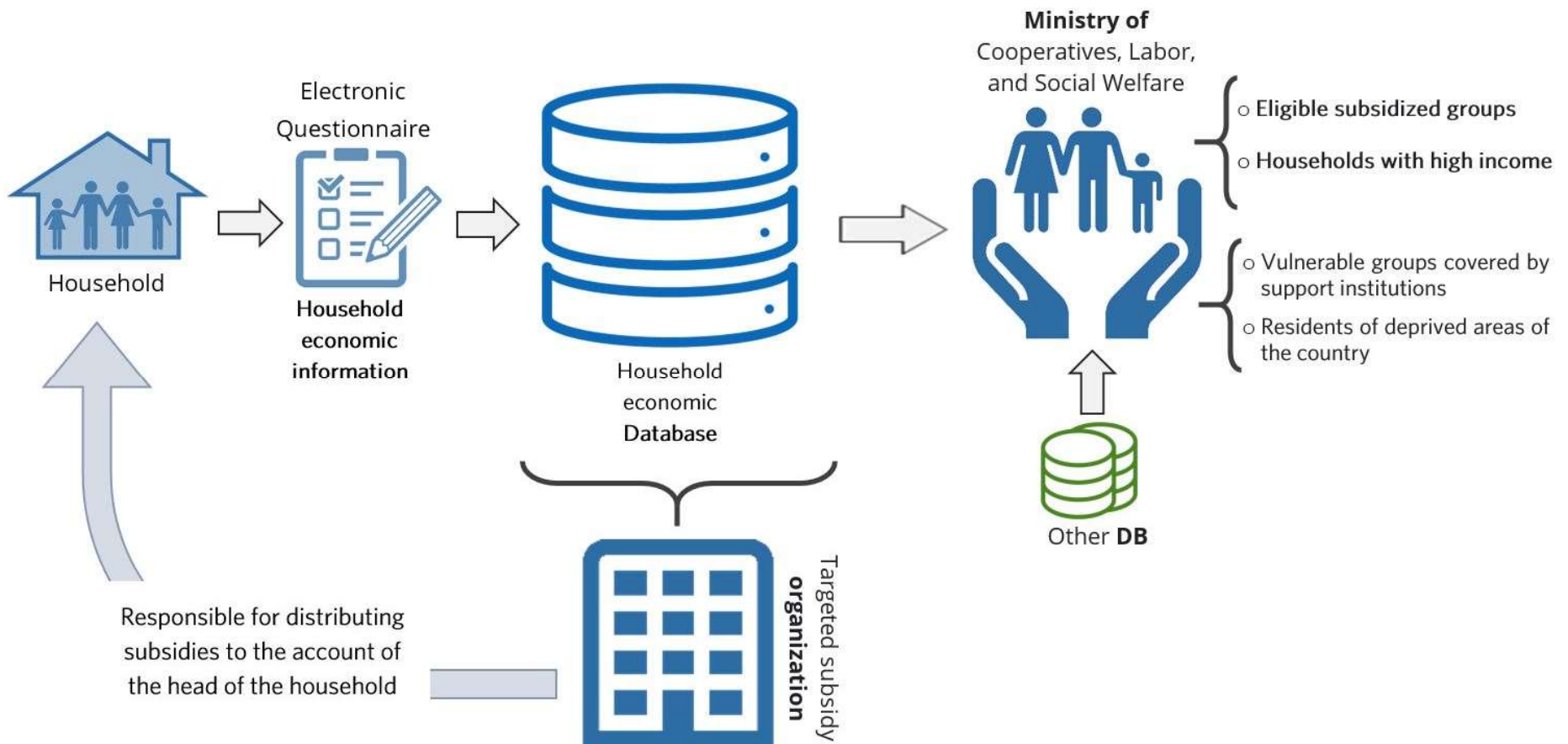
- Price adjustment is foreseen for a period of 5 years.
- By the end of the period, the average price of **energy carriers** (gasoline, diesel, fuel oil, kerosene, and other petroleum products) will be **at least 90% of the average FOB prices in the Persian Gulf**.
- The average **price of crude oil** and **gas** condensate delivered to the country's refineries will be at least **95% of the FOB Persian Gulf prices**.
- The average price of **natural gas** will be at **least 75% of the average price of natural gas for export**.
- The average selling **price of water and electricity** will be **based on its cost price**.
- FOB Persian Gulf price fluctuations of energy carriers up to 25% will not affect domestic prices.
- Subsidies on commodities such as **wheat, rice, milk, sugar, postal services, airline services, and rail** (passenger) services are **eliminated**.
- **50% of the net released funds** will be redistributed to **low-income groups, 30% to production, and 20% to the government for development projects**.

TSP in Annual Budget



Understanding Social Model:

Identifying eligible households and key actors



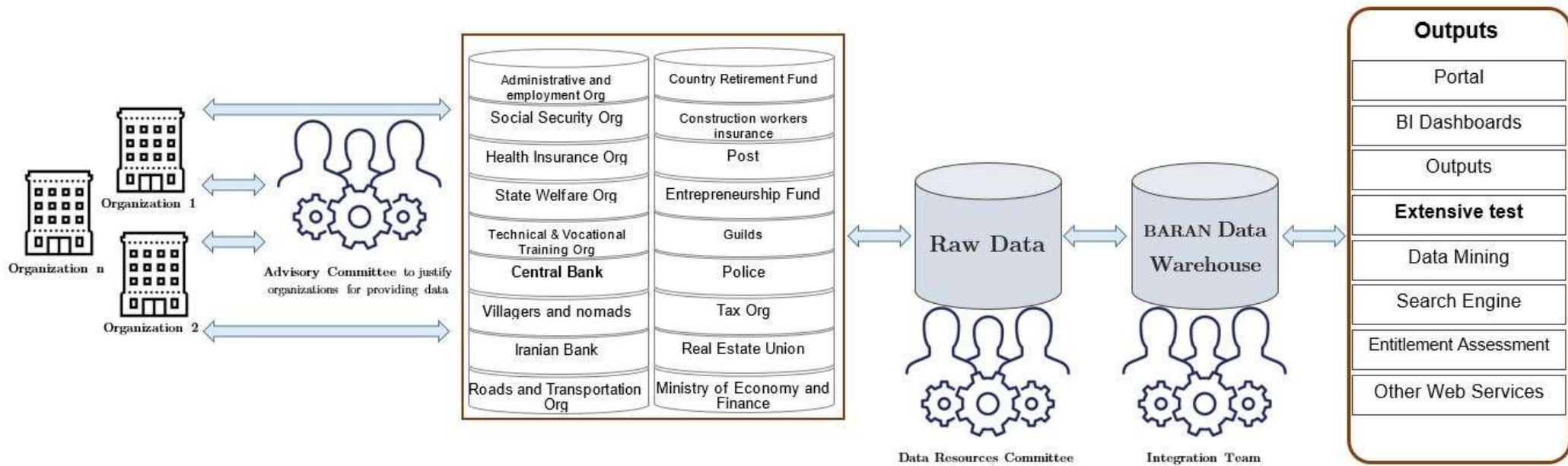


AI Implementation Status:

AI and identification of eligible households

- A few years after the implementation of TSP, the government repeatedly stated that it did not have the resources to pay the subsidies
 - High-income households should be excluded from receiving the subsidies.
- First attempt: **to withdraw voluntarily**
 - encouraging high-income citizens to withdraw from receiving subsidies voluntarily.
- Second attempt: **data driven decision making, machine judgment**
 - the government has resorted to more accurate collection of financial and monetary data of households and data analysis based on artificial intelligence.

Iranian Welfare Database (IWDB)





Some Applications of IWDB

- **Paying fuel subsidies** to the people and Supporting Living Package in 2019.
 - About 60 million people (18 million households) were identified in the payment of this support package with the help of information analyzed from "Iranian Welfare Database."
- **Payment of Covid-19 bank loans** to those affected by the outbreak. The beneficiaries of this plan were identified through the information extracted from the database, and in different stages, different types of loans were transferred to the accounts of eligible citizens according to the needs of the individuals.
- **Elimination of the decile of receiving subsidies**, according to the law of the parliament, its implementation required the identification of high-income deciles, done with the help of the information in the database.



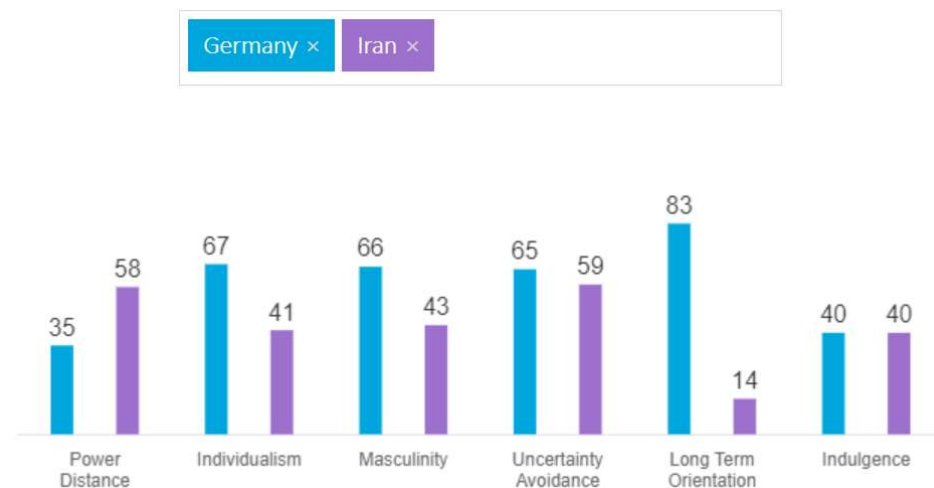
Eligibility of households using the test Means

- **Initial quantities:** Quantities that are used raw and unchanged. Among these quantities are the following:
 - Family size
 - Gender of the head of the household
 - Number of vehicles
 - Total car value
 - Declared property number
 - Number of foreign trips

- **Composite quantities:** These quantities are made using several other quantities.
 - Being a doctor
 - Being a public manager
 - Being employed, which includes the salary in social security, doctor, public manager, lawyer, faculty member, individual employer, legal employer, exchange office, employee, and guilds.
 - The age of the head of household, is labeled as the young head (less than 25 years old), middle-aged head (between 25 and 54 years old), and elderly head (more than 54 years old).
 - The average age of the household, is mapped to tags such as young household (less than 29 years), middle-aged household (29 to 46 years old), and elderly household (more than 46 years old).
 - Number of people of working age
 - Weighted dimension of household: Weight distribution of households based on household members in the child (under 11 years) - adolescent (between 11 to 17 years) - adult (over 17 years)
 - Province and region of residence
 - Mean housing value

Hofstede Insights

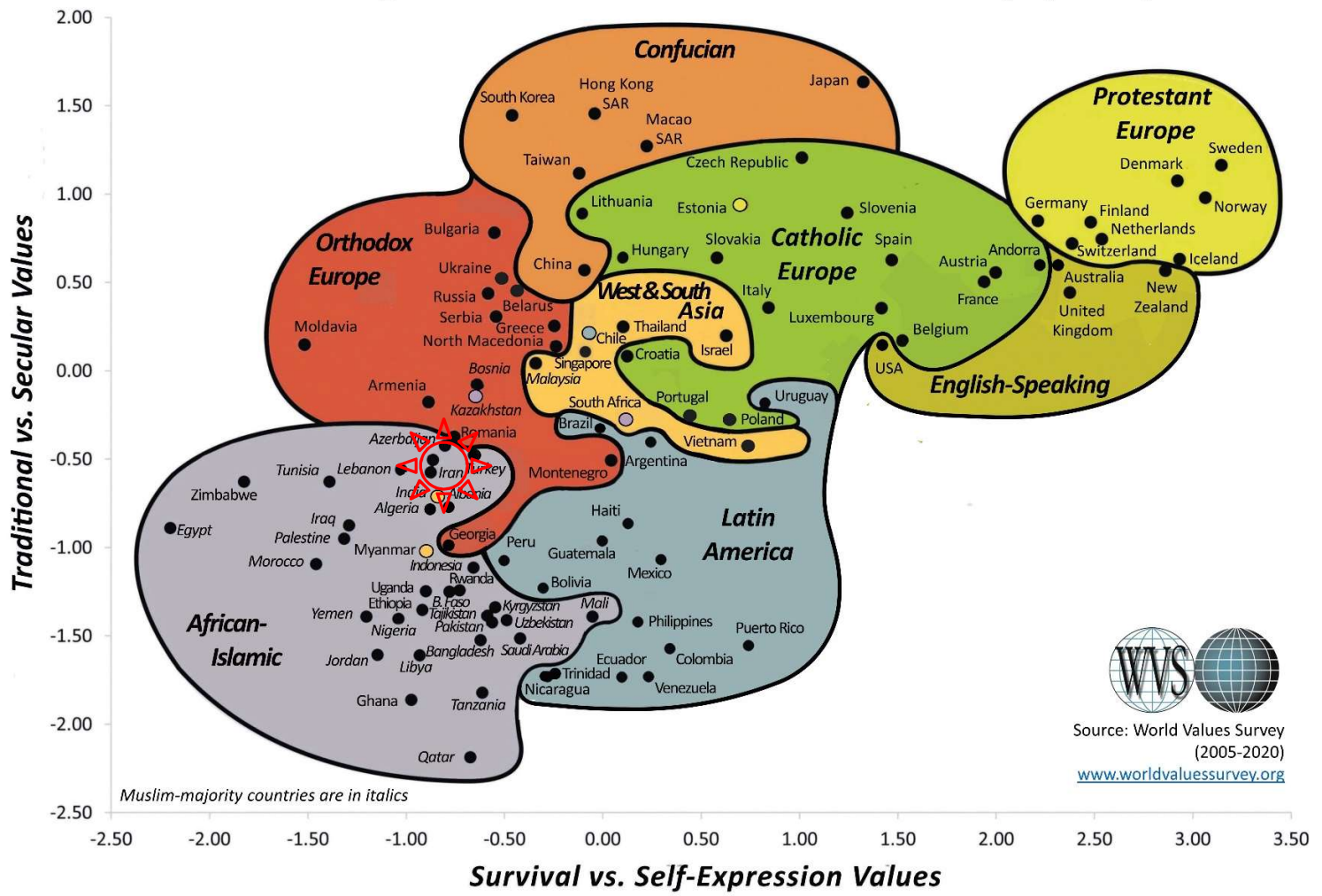
- **Power Distance Index**
 - Iran is a hierarchical society.
- **Individualism**
 - Iran, is considered a collectivistic society
- **Masculinity**
 - Iran is thus considered a relatively Feminine society, the focus is on “working in order to live”.
- **Uncertainty Avoidance**
 - Iran has a high preference for avoiding uncertainty, maintaining rigid codes of belief and behavior, people have an inner urge to be busy and work hard, **innovation may be resisted.**
- **Long Term Orientation**
 - Iran has a strongly normative cultural orientation, a strong concern with establishing the absolute Truth; great respect for traditions, **focusing on achieving quick results.**
- **Indulgence**
 - Iran has a culture of restraint, tendency to cynicism and pessimism, not put much emphasis on leisure time and control the gratification of their desires.



Country Comparison Report
hofstede-insights.com



The Inglehart-Welzel World Cultural Map (2020)





Data Fields Used in Data Analysis

| Type of Information | Informational Field |
|-------------------------------|--|
| Personal Information | Person ID |
| | Head of household ID |
| | Date of birth |
| | Gender (1: Male - 2: Female) |
| Address | Postal Code (7 digits) |
| | State |
| | City |
| | Is the person a resident of the city? |
| Financial Information in 2016 | Credit turnover of individual accounts in 2016 |
| | Debt turnover of individual accounts in 2016 |
| | Balance at the beginning of the year, personal accounts in the year 2016 |
| | End of year balance of individual accounts in the year 2016 |
| | Total profit of personal accounts in the year 2016 |
| Financial Information in 2017 | Credit turnover of personal accounts in 2017 |
| | Debt turnover of personal accounts in 2017 |
| | The balance of the beginning of the year of personal accounts in the year 2017 |
| | End of year balance of personal accounts in the year 2017 |
| | Total profit of personal accounts in the year 2017 |



Data Fields Used in Data Analysis (Continue)

| | |
|--------------------------------|--|
| Financial Information in 2018 | Credit turnover of personal accounts in 2018 |
| | Debt turnover of personal accounts in 2018 |
| | The balance of the beginning of the year of personal accounts in the year 2018 |
| | End of year balance of personal accounts in 2018 |
| | Total profit of personal accounts in 2018 |
| Financial Information in 2019 | Credit turnover of personal accounts in 2019 |
| | Debt turnover of personal accounts in 2019 |
| | Balance at the beginning of the year, personal accounts in 2019 |
| | End of year balance of personal accounts in 2019 |
| | Total profit of personal accounts in 2019 |
| | Amount of personal card transactions in 2019 |
| | Number of personal card transactions in 2019 |
| Financial Information in 2020 | Amount of personal card transactions in the first six months of 2020 |
| | Number of personal card transactions in the first six months of the year 2020 |
| Disability of specific patient | Is the patient-specific? |
| | Is the person disabled? |
| Tax and insurance info | Is the person an insurer of pension funds? |
| | Is the person retired from pension funds? |
| | Is the employee taxable? |
| Income and assets | Total personal income (from salary) |
| | Number of personal cars |
| | The total value of personal cars |
| Ability to travel | Number of non-pilgrim foreign air trips 2017 to 2020 |
| | Number of non-pilgrim foreign land trips 2017 to 2020 |
| | Number of foreign pilgrimage air trips 2017 to 2020 |
| | Number of foreign pilgrimage land trips 2017 to 2020 |
| Guild license | Does the person have a trade union license? |
| | Guild license |
| health insurance | Does the person have health insurance |
| | Type of health insurance |



Data Mining in IWDB

- **Cooperation with the Tax Affairs Organization (TAO) to introduce 300,000 wealthy households without tax records:** Based on the test Means and assets of Iranian households and its compliance with the data of the TAO, these households were identified and introduced to TAO.
- **Analysis of the status of the outstanding students (elites) in the national entrance exam for the National Elite Foundation:** The National Elite Foundation provided the employment and residence status of the first 20,000 entrance exam students in different years to this ministry. For the first time, the correct amount of immigration and other elite information was analyzed.
- **Cooperation with the Ministry of Science, Research and Technology to analyze the labor market of graduates:** The Ministry of Science provided the national code of graduates of the two universities, which was analyzed by adapting it to social security data.



Conclusion

- Targeted subsidies plan (TSP) as the largest economic plan in Iran as a case study in AI-FORA project
- The social model of the plan was studied and due to limited resources, the need to target subsidies to low-income households and eliminate high-income deciles for decision-makers and policymakers was considered.
- Attempts have been made to eliminate high-income deciles that have not been successful
- AI and data analysis were considered as a suitable tool to eliminate high-income deciles in the TSP in Iran. This is the concern of the AI-FORA project.
- Various data were collected from different databases and financial profiles were formed for each Iranian citizen, and finally, in the form of household financial profiles and Iranian welfare database, it was used for decision making.
- By aggregating data and creating the Iranian welfare database, AI has been used to determine the deserving and the non-deserving in various areas of Iran's economy and politics.
- In the rest of the research, we will examine the **side effects of implementing artificial intelligence** and provide **policy recommendations** for the **development of responsive artificial intelligence**.

Comments and Questions

