AI FORA

Unemployment Game Specification

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| **Document History** | |  |  |
| **Version** | **Date** | **Author** |  |
| 1.0 | 15/4/2022 | Nigel, Petra, Frederick | Initial |
| 1.1 | 19/4/2022 | Nigel | With NetLogo ABM |
| 1.2 | 20/4/2022 | Nigel,Albert, Petra, martha, Elisabeth, Jan | Add voluntary fund and additional agent attributes |
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## 1 Topic

**In a nutshell: AI FORA**

* empirically analyses value/context dependency in AI-based social assessment of social service provision comparing eleven countries as case studies,
* identifies welfare and technology gaps
* and develops chances for improving policies for contextualized AI systems that areresponsive to value dynamics in societies

**Main hypothesis**

What is perceived as good distribution practice in a national welfare system largely depends on cultural values:

* What is considered as “socially fair“ in one country/context, might be considered as highly discriminatory in another
* Also, attitudes towards AI use for public service provision may vary between countries/contexts

**Purpose of the game**

The game is to help to test this hypothesis. It generates data, complementing surveys and qualitative research data collected in the case studies. The game mimics a typical situation of AI-based social assessment in social service provision (job management and unemployment benefits) that occurs in all case study countries.

While the case studies and empirical data generated are highly heterogeneous, the game can be played in all case study countries as an opportunity to create comparable datasets.

## 2 Users

People play the game in case study workshops. A typical game will last for half a day and involve up to 20 players.

## 3 Research question

Do different cultural values/backgrounds affect the playing behaviour?

## 4 Background

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## 5 Game-level features

The game should be calibrated to correspond to the local cultural situation. For example, the names of the stations and titles of the available jobs should be in the local language. The ‘school’ may be better named University, Technical College, or Community College, depending on local terminology.

Case study partners will need to provide information about such localisation.

## 6 Types of entities

### 6a Agents

The characters in the game are individuals who seek good careers, measured by their wealth (their money units) and their quality of life (happiness units). The agents’ aim is to maximise the sum of their wealth and happiness.

### 6b Resources

Quantities and features that are available in the environment for agents to obtain or use

* Money (measured in money units) - unlimited amount available
* Education (measured as months of training) - unlimited amount available
* Happiness (measured in happiness units) - unlimited amount available
* Jobs (divided into bad jobs and good jobs) - totals of occupied jobs and vacancies for each type (good and bad) is fixed at the sart, but may be increased using the Voluntary Solidarity Fund.

### 6c Other objects

There are ‘stations’ (i.e. places) that agents visit:

* Home
* Job agency
* Workplace
* Training Centre
* Holiday Resort
* Town Hall

## 7 Environment

### Spatial environment:

Fixed spatial geography in which the stations are placed (this remains the same in all localizations).

### Temporal environment:

The game proceeds by ‘rounds’. Each round corresponds to one month of the agents’ lives. A round is completed when every agent has had a turn. Agents take turns in arbitrary, but fixed, order. The game proceeds for a specified number of rounds (there is no other termination condition).

### Voluntary solidarity fund

Represents the work of charities/NGOs.

Agents can contribute as much money as they like (provided that they have that much money) after every round.

The money is used to increase the number of jobs in the game. A good job ‘costs’ some amount of money and a bad job a lesser amount. If there is not enough money to fund another job, the excess remains in the fund until more is contributed.

## 8 Agent attributes

Attributes that change as the game progresses:

* Employment status: unemployed, good job, bad job
* Age: increases by 1 month in each round.
* Wealth: in money units, obtained from salary, differing according to type of job
* Happiness: obtained from being at the holiday resort
* Training: increases when agent attends school
* Extent of social network: expands for each round spent in work or in town hall

Attributes that are fixed from the start of the game:

* Gender (male/female)
* Household composition(i.e. Whether single or a parent)
* Ethnicity (depends on locality; for Europe - white/ethnic minority)
* Interpersonal (‘social’) skills (e.g. leadership, empathy, communication): high/low
* Vulnerability (e.g. disability) (vulnerable/not vulnerable)
* Place of residence: (poor area/rich area)

## 9 Environmental attributes

### 9a Global attributes

Round number, starting with zero

Number of good and bad job vacancies at start of each round

### 9b Local attributes

#### Station properties:

Home: Agents who are unemployed, and not on holiday, at school, seeking a job at the job agency, or socialising at the town hall, stay at home. Summary information about the environment (e.g. total wealth, happiness education) is available here for agents to see if they wish. It costs one money unit to stay at home. If they have no money, they receive money in welfare benefits, but are charged for living expenses.

Job agency: The agency has a stock of good and a stock of bad vacancies. As players get jobs, these reduce, but get replenished as workers lose their jobs. The agency can run out of jobs if its stock becomes exhausted, in which case it cannot provide that kind of job.

The job agency has an assessment procedure, which evaluates agents that arrive at the agency, and provides the agents with a job (good or bad) or provides no job, depending on the assessment criteria in use. The criteria used can be changed by regulations successfully voted on at the Town Hall (e.g. to use an AI based assessment or not; to weight some individual attributes over others).

If the agent doesn’t get a job at the agency, they do get unemployment benefits (if they have worked for some months previously) or welfare benefits*.*

Workplace: The workplace is only accessible to agents who are employed. The agents earn a salary every round. The amount depends on whether they are employed in a good or bad job.

At the end of the round a proportion of those in the workplace are fired and become unemployed.

Training Centre:

Agents receive one month’s training. More highly trained agents are more likely to get good jobs. The maximum amount of training an agent can receive is 10 months. Education is free.

Holiday resort:

Agents on holiday increase their happiness each round. However, it costs money per round to be on holiday. If an agent doesn’t have sufficient money units to afford to pay for their holiday, they cannot go on holiday.

Town hall: provides assessment criteria and selection algorithm for the job agency. Staying at the town hall is free of charge.

## 10 Initial values of attributes

### Individual:

All drawn randomly from a normal distribution with mean as below, and standard deviation of 0.5 \* mean, but with no negative values, except where noted.

* Wealth: 10 units
* Training: 5 units
* Happiness: 10 units
* Interpersonal skills: either high or low, with equal probability
* Household composition: either single or family, with equal probability
* Gender: either male or female, with equal probability
* Ethnicity: either white or ethnic minority, with equal probability
* Extent of social network: zero

Attributes that are fixed from the start of the game:

* Gender (male/female)
* Household composition(i.e. Whether single or a parent)
* Ethnicity (depends on locality; for Europe - white/ethnic minority)
* Interpersonal (‘social’) skills (e.g. leadership, empathy, communication): high/low
* Vulnerability (e.g. disability) (vulnerable/not vulnerable)
* Place of residence: (poor area/rich area)

Employment status: all are initially unemployed

### Society:

Good vacancies: as set

Bad vacancies: as set

### Job agency assessment:

Currently implemented:

* Random: Agent is given a good job, a bad job, or left unemployed with equal probability
* Require social skills for good jobs: As random, but agents with high social skills are always given good jobs (provided that there are good job vacancies)
* Require social skills or degree for good jobs: As above, but good jobs also go to those with degrees

If good jobs run out, award bad jobs to those who are eligible for good jobs, but if the bad jobs run out, don’t award any job.

All other individual attributes can be used in regulations with different criteria.

However, an AI based assessment cannot use Interpersonal skills

## 11 Interactions between agents and environment

At the beginning of each round, each agent in turn decides which station it wishes to visit next. It then goes there, it carries out activities at the station and its wealth, happiness and education are adjusted.

Each agent grows older by one month.

Agents have to pay rent (and living expenses) every month.

If the agent is unemployed, they lose happiness units.

Agents may receive welfare benefits if they have no money and are at home or are in the job agency and have no recent work experience; unemployment benefit in the job agency if they are unemployed and have recently had a job; or disability benefit if they are at home or unemployed in the job agency and are vulnerable. Disability benefit is worth more than unemployment benefit which is worth more than welfare benefit.

## 12 Agent-agent interactions

Agents do not interact directly except at the town hall. There they can deliberate about what they consider to be the best criteria to use to allocate jobs, and may propose regulations. In order to have effect, a regulation must be approved by a majority of all agents. If a new regulation is proposed, a vote about whether it should be passed (i.e. implemented) is taken at the end of the round. If passed, the new regulation is implemented for the next round.

## 13 Conditions for action

Agents can only go to the:

* Job agency if unemployed
* Training Centre if they have had less than 10 units of training
* Workplace if employed
* Holiday resort if wealth > holiday cost
* Town Hall if not been there the previous round

There are no conditions for staying at home.

Agents can use a ‘strategy’ to choose which station to go to next. For example, they might decide to focus on earning as much money as possible (by always selecting the workplace as their next station, or the job agency if they become unemployed), or they might focus on increasing their happiness (by always going on holiday if they can afford it).

## 15. Agent entry and exit

All agents start at the beginning of the game and continue in the game until the game ends (the stopping point is determined by the facilitator - the ‘winner’ is then the agent/player with the highest total of wealth and happiness).