

# AMS ALGORITHM ON TRIAL

## IN BRIEF

- The Austrian Public Employment Service (AMS) has been testing a system for the statistical profiling of jobseekers since the end of 2018. On the basis of forecasting, jobseekers are divided into three groups to which different resources for further training are allocated.
- Administrative data, which form the basis of the model, provide a specific and simplified view of labour market opportunities.
- Consequently, specific training on the use of algorithms, comprehensive transparency on their effects, and social participation are needed.

## WHAT IS IT ABOUT?

Since November 2018, the Austrian Public Employment Service (AMS) has gradually introduced an algorithmic system to forecast the chances of jobseekers. Based on these predictions, jobseekers are divided into three groups, each of which shall later be provided with different support measures. For this purpose, the system calculates whether a client is likely to successfully re-enter the labour market in the short or long term. Based on the calculations, jobseekers are classified as successful in the short term if they are likely to find gainful employment for 90 days over a period of seven months. Persons are classified as successful in the long term if they are expected to work 180 days in a non-subsidised position within 24 months.

To predict the successful entry into paid work this calculation uses previous “business cases”: the algorithmic system learns from historical administrative data of the AMS. To this end, it looks for correlations between jobseekers’ characteristics and successful employment. The characteristics include age, citizenship, sex, education, care responsibilities, and health

impairments as well as past employment, contacts with the AMS, and labour market data of the location of residence.

The forecast relies on statistical methods to learn which characteristics correlate positively or negatively with the short-term or long-term perspective of the “business case” at different points in time, i.e. the point in time when a person reports as seeking employment.

In addition, individual probabilities for short-term and long-term re-entry are calculated for current jobseekers. With a probability of short-term success of over 66%, they are assigned to group A with high chances. A probability of long-term success of less than 25% assigns them to group C with low chances. All others are assigned to group B with medium labour market opportunities.



Since November 2018, a new algorithmic classification system has been in use at the Public Employment Service.

The AMS assures that the automated group assignment can be changed by the consultants if necessary. This option is mainly justified by the fact that information about clients’ appearance, motivation and other “soft skills” cannot be included in the algorithmic model.

Based on the group allocation, varying offers for further training will be made available in the future: clients with good statistical chances for re-entry (group A) are to receive less support as it is assumed that they will find work again independently. For clients in group B, the current offers will continue to exist. In the case of a low mathematical probability of re-entry, AMS clients will be offered low-threshold courses such as physical exercise, which do not directly serve to re-enter work life.

According to the AMS, the new system promises a higher accuracy of the agency’s offers and more efficient consulting while also relieving case workers. In public debates, critics countered that the algorithm ultimately puts groups that are already disadvantaged on the labour market in an even worse position.

## CHALLENGES AND CRITICISM

The algorithmic system poses a number of challenges that also affect other similar systems in public administration. One problem concerns the algorithm and its underlying model. The administrative data that form the foundation of the model provide a specific and **simplified view of labour market opportunities**. The so-called “labour market opportunity model” predicts poorer opportunities for women, older adults, and people with disabilities.

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= f ( 0,10
- 0,14 x GESCHLECHT_WEIBLICH
- 0,13 x ALTERSGRUPPE_30_49
- 0,70 x ALTERSGRUPPE_50_PLUS
+ 0,16 x STAATENGRUPPE_EU
- 0,05 x STAATENGRUPPE_DRITT
+ 0,28 x AUSBILDUNG_LEHRE
+ 0,01 x AUSBILDUNG_MATURA_PLUS
- 0,15 x BETREUUNGSPFLICHTIG
```

Prediction of worse chances for socially disadvantaged groups

The AMS asserts that this model is merely a “representation” of the status quo on the labour market and that the forecasts are “objective”. However, the selection of the characteristics and the allocation to the three groups are based on **socio-political decisions rather than mere market conditions**. For instance, clients with several of the mentioned characteristics are classified even lower, which leads to a rapid descent into group C, i.e. the prediction of bad chances of placement leads to a reduction of support offers – a potentially self-reinforcing process. One criticism of the statistical methods highlights that they can provide useful predictions at population or group level, but provide **limited meaningful information on an individual**. In addition, the model only shows correlations but does not provide information on causal relationships.

**Social practice** plays a central role as well. A thorough consideration of how the algorithm is used in the counselling process and what instructions AMS consultants are given for dealing with the classification is essential. It is important to know, for example, under what conditions and with what justification they can change the automatic classification and whether adequate training of AMS staff is carried out.

When using automated decisions in socio-politically sensitive areas, **comprehensive transparency** is necessary in order to initiate social debate. The decisions taken during the development phase as well as the embedding of the technology into counselling practice are of public interest. Only through transparency can a meaningful participation of those affected and important social stakeholders be ensured (e.g. Chamber of Labour and the Ombud for Equal Treatment).

## WHAT TO DO?

**The (semi-)automated evaluation of humans can have far-reaching consequences. Particular care is required when developing and applying algorithmic systems in public domains. The findings on the AMS algorithm can also be applied to other automated systems.**

- Algorithms can only offer a particular, narrow view of the real world. Users of algorithmic systems therefore need specific training and new skills in order to correctly assess the limitations of statistical methods.
- The introduction of algorithmic systems with high social relevance requires comprehensive transparency and accessible information for the general public. This is to enable citizens to participate in a critical debate on such systems from the moment of their conception to their implementation in the organisations.
- The choice of data, models, and algorithmic methods that shape the system has far-reaching and potentially discriminatory consequences. Because of their impact, independent monitoring, auditing and evaluation are necessary.
- Because of the limitations of algorithmic systems, non-technical solutions must not be discarded. For example, a good consultant-to-jobseeker ratio allows for catering to and consulting with jobseekers, and has proven to be productive.

## FURTHER READING

Veale, M., Van Kleek, M., & Binns, R. (2018). Fairness and Accountability Design Needs for Algorithmic Support in High-Stakes Public Sector Decision-Making, *Proceedings of CHI 2018*, ACM, 440.

<https://arxiv.org/abs/1802.01029>

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