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Published in:

Proceedings of the European Conference on the Impact of Artificial Intelligence and Robotics, ECIAIR 2020

DOI:

10.34190/EAIR.20.002

Publication date:

2020

Document version:

Final published version

Citation for pulished version (APA):

Motzfeldt, H. M., & Næsborg-Andersen, A. (2020). Relevant Distinctions in Relation to Explainability in the Public Sector. In F. Matos (Ed.), *Proceedings of the European Conference on the Impact of Artificial Intelligence and Robotics, ECIAIR 2020: ECIAIR 2020* (pp. 86-92). Academic Conferences and Publishing International. <https://doi.org/10.34190/EAIR.20.002>

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Relevant Distinctions in Relation to Explainability in the Public Sector

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DOI: 10.34190/EAIR.20.002

Abstract: This paper argues that jurisprudence can offer a relevant contribution to the international debate on the use of artificial intelligence in the public sector. From a legal perspective, a distinction can and should be made between two types of AI-based solutions, namely fact-producing and those that represent a transformation of norms (legislation). Under Danish Administrative Law, mainly the latter solutions must be fully explainable. This distinction might be relevant for other disciplines than jurisprudence and be a contribution to the internationally debated hot topic of whether transparency must be ensured via ethical principles or regulation.

Keywords: Artificial intelligence, machine learning, administrative law, explainability, transparency, ombudsman

1. Introduction

The World Economic Forum estimated in 2017 that the development of artificial intelligence is one of the technological advances with the greatest potential societal value. Conversely, the organisation highlighted that there are severe risks attached to the use of this technology. The Global Risk Report 2017 therefore recommended debate and reflections on how it can be ensured that the development and use of artificial intelligence can be executed in a sound manner (World Economic Forum 2017).

The call for discussions was clearly noted and followed, as debates have been held in many forums and still are going on. The OECD has published a number of reports and issued a recommendation in May 2019 (OECD 2019). The UN published a highly critical report in October 2019 (UN Special Rapporteur 2019). Among other things, the summary of the UN report states the following:

“The digital welfare state is either already a reality or emerging in many countries across the globe. In these states, systems of social protection and assistance are increasingly driven by digital data and technologies that are used to automate, predict, identify, surveil, detect, target and punish. In the present report, the irresistible attractions for Governments to move in this direction are acknowledged, but the grave risk of stumbling, zombie-like, into a digital welfare dystopia is highlighted.”

Within the European cooperation framework, the EU prepared a Coordinated Plan on Artificial Intelligence in 2018 (COM (2018) 795). As part of the plan, and to accommodate a recommendation from the European Parliament for regulation, a number of working groups have since been established to discuss the need and the possibility to adopt ethical and legal requirements for the technology and its use in various fields (European Parliament 2017). A number of ethical recommendations were soon published (High-Level Expert Group 2019). Reports and analyses from the other groups are regularly sent to the relevant bodies. Thus, there is indications of an increased awareness surrounding the need for regulation of the use of artificial intelligence. For example, it is expected that as part of the recently launched strategy, Shaping Europe's Digital Future, the European Commission will put forward proposals for regulation related to liability in 2020 (European Commission 2019). Most of these discussions, reports and analyses are characterised by a focus on transiency.

Denmark also has high hopes for - as well as concerns about - using artificial intelligence in the public sector. The former government prepared, e.g., a national strategy for artificial intelligence in which, among other things, a data ethics committee was established, general ethical principles were prepared, and a number of so-called signature projects were initiated. Via these signature projects, the technology will be tested in the public administration and experiences will be gained (Danish Ministry of Finance 2019). This makes Denmark relevant as an example of a country with a high degree of artificial intelligence, but where the legislation has not necessarily been formally updated to (clearly) reflect this.

Section 2 below points out why it is relevant from a legal perspective - also when drafting new regulations - to distinguish between two different kinds of digital solutions based on artificial intelligence. This distinction becomes clear when applying the basic principles developed in the case law of the Danish Ombudsman, as these principles compel an assessment of which issues are legally relevant. Therefore, section 3 briefly introduces the Institution of the Danish Ombudsman, and his case law of administrative law by design and good administration impact assessment. The relevant regulation for artificial intelligence able to generate fact for use in administration is identified first. Secondly, digital solutions convert (transforms) legal norms into codes that are discussed. Section 4 contains a brief summary. In all analytical sections, a traditional legal dogmatic method is used to find the legal principles resulting from the norm of good administrative practice enforced by the Danish Parliamentary Ombudsman.

2. Artificial intelligence and decision support tools in Denmark

In Denmark, the terms decision support tools and decision support robots are commonly used when technologies based on artificial intelligence are used as a part of processing administrative cases aimed at forming decisions addressed to citizens, e.g. tax calculations or assessments of whether citizens can receive social benefits. Thus, the terms are broad and cover various uses of machine learning-based technologies.

The majority of such solutions in Danish public administration are what we define as fact-generating. An older example is the Danish tax authorities' development of a real estate valuation system. The aim of this digitalisation project is automated valuation of privately-owned property. The developed model is – reportedly – able to estimate the value of land and properties after being presented with a variety of data about the property (SKAT 2014). Some of the automated generated valuations are expected to go through manual checks, though. Another example is the Danish Environment Protection Agency (EPA) developing a solution able to recognise habitat from pictures taken by overflying drones. (Danish Environment Protection Agency 2019).

The above-mentioned property valuations are to be used in the tax authorities' administration, as the estimated value forms the input for calculating tax under Danish tax legislation. In the past, trained professional valuers conducted such property valuations in a purely analogical context. However, the valuers did not interpret the relevant legislation, nor did they calculate the tax to be levied from the citizens etc. In other words, the system automates the previous professional valuations, not the caseworker's administrative tasks. Similar, the Danish Environment Protection Agency's categorisation of habitats will, among other things, be used as underlying facts in cases under various legislation related to environmental protection. In other words, the digitally generated categorisations are to be used for imposing anti-pollution measures on companies or even prohibit activities in vulnerable areas, etc. A variety of solutions based on artificial intelligence is, however, being (further) developed in Denmark to support other aspects of the public authorities' case processing. In line with this development, the legal characteristics also change. An example is the robot ASTA, which is developed and used by the City of Copenhagen in collaboration with a private company (Andersen 2019). ASTA has long been able to profile unemployed citizens by generating a prognosis for their future job situation. However, ASTA is under further development in order to be able to 'recommend' which provisions under employment law are best suited to be applied in a specific case (Schultz 2019 & Knowledge Across 2019). An even more far-reaching example is from the Municipality of Frederiksberg. Here, an artificial intelligence-based solution is being developed to "support staff in assessing whether an unemployed citizen should be penalised for not attending a meeting or imposed activity. The algorithm supports staff by making decisions based on training from thousands of cases to support uniform assessment practices across the spectrum." (KL 2020). As the solution is described in Local Government Denmark's project catalogue, the purpose is specifically meant to support the legal assessment of whether a citizen has 'fair cause' to be absent from meetings or activities.

Thus, there is a gradual movement towards artificial intelligence being used to support legal processes and assessments. ASTA gives case officers' advice on which of the many statutory provisions they should apply to a specific case. Here digitisation is so-to-speak moving towards legal grounds. In Frederiksberg Municipality, the authorities have gone a step further in training artificial intelligence into handling a legal norm (assessing whether there are 'fair cause' for absence or whether the citizen should be penalised).

From a legal perspective, there is a significant difference between the above two applications of artificial intelligence – the fact-finding and the legal assessment – despite the boundary between them sometimes overlapping. The reason why the distinction is important is that very different legal principles regulate these two types of activities.

3. Good administrative practice

3.1 The parliamentary Ombudsman

As previously described, the Danish Parliamentary Ombudsman is highly influential when developing the legal frameworks for public administration in Denmark - with special focus on eGovernment in recent years (Motzfeldt & Næsberg-Andersen 2018 I). The Office of the Danish Ombudsman uses the norm of good administrative practice when adjusting Danish Administrative Law to the increasingly digitized public administration. This norm of good administration is dynamic and connected to rule of law and democratic principles mixed with ethical considerations (Larsen 2005). Good administrative practice therefore functions as an underlying adaptable standard – much similar to the proposed use of ethical standards as regulator of artificial intelligence.

Recent years the office has developed the principle of administrative law by design and the requirement of Good Administration Impact Assessments. Administrative law by design fundamentally requires that digital solutions in the public sector are designed to support compliance with legislation and fundamental legal principles. To ensure this, the authorities are obliged to map the relevant legal framework at the very beginning of a development process. In other words, they are to perform a Good Administration Impact Assessment (Motzfeldt 2017 & Motzfeldt & Næsberg-Andersen 2018 II).

3.2 Requirement for proper organisation and workflows

In Denmark, the norm of good administration implies that administrative authorities are to establish organisations, workflows and procedures able to support compliance with relevant legislation (Talevski 2018). The requirement for such sound and proper working routines and organisation design is described, for example, in the Danish Ombudsman's statements in case numbers FOB 1992.232, FOB 2006.165 and FOB 2008.380.

An early example of eGovernment practices is FOB 2006.390. The case concerned a records system used by the University of Copenhagen. The system was not designed to enable caseworkers to search for cases based on categories or, for example, provisions laid down in the legislation. The Ombudsman doubted that the University of Copenhagen would be able to carry out uniform practices if the office was unable to conduct searches within its own collection of cases. Furthermore, he stated that a public authority's compliance with the principle of equality in administrative law requires the authority's staff is able to gain knowledge of the authority's previous administration of a given set of rules. In other words, a search function was necessary to respect the principle of equality and should have been included in the design of the system from the start.

The Parliamentary ombudsman's requirements for such compliance-promoting design vary in Denmark depending on the functionalities of the digital solution – and their impact on administration and decisions directed at citizens. If the risk of unlawful administration is low, e.g. the digital tools are relatively simple, it is accepted that the use of analogue workflows can compensate for flaws in the technical design. This approach is seen in the above-mentioned FOB 2006.390, as the parliamentary Ombudsman stated, that the university could compensate for the lack of search mechanisms by creating and maintaining a list of cases representative for the established practices. However, the same degree of pragmatic and holistic flexibility does not fully apply as the risk of violating relevant legal principles or statutory provision increases. In other words, an underlying risk-based approach can be identified. One example of a high-risk area is fully automated decision-making. Another example is decision-making to a greater or lesser extent are transformed into programming. Here the standard is strict. Examples are: FOB 2014-24 on the joint IT system for debt collection (EFI) and 2019-17 FOB on 'Én skattekonto' (One Tax Account System).

One Tax Account system has established one account for each company in Denmark. Via this account, the financial balance of these companies' tax payments accrues interest on a daily basis and the interest is added to the account each month. See the Danish Act on the Collection of Direct and Indirect Taxes, Section 16(c), Subsection 1. The One Tax Account system was implemented on 1 August 2013 with the intention that the initial interest would be calculated and attributed at the end of the same month. However, the quality of the input data turned out to be questionable and flaws related to the

programming of the calculations were detected. The use of the feature was therefore delayed. The flaws within the system were completely rectified two years after implementation. In FOB 2019-17, the Ombudsman sharply criticised the process and at the same time he stated that system with such defects are not to be put into operation at all.

In other words, use of analogue workflows can compensate for flaws in the technical design in some administrative areas, but the obligation to ensure a technical design promoting compliance becoming more stringent as the system automates decisions processes. From a legal perspective, such a variety is natural since it is based on the risk of the solutions affecting the decisions taken and directed at the citizens.

3.3 Requirement for decision support systems

In Denmark, the relevant legal framework for fact-generating digital solutions based on artificial intelligence is the unwritten principles of public authority's obligation to provide the true and accurate facts as a basic for any administrative decision. So-called objective information must be verified, if possible. Estimates must be acceptable, based on sufficient information and not deviate by too high a percentage compared to the outcome the courts would reach. Expert reviews are to be compliant with the professional standards within the given field, e.g. the valuation area or the environmental area. These old principles of administrative law also govern the use of those decision support systems, which generates the factual basis for administrative decisions. If the use of a decision support system results in profiling of natural persons, however, the younger regulation laid down in the GDPR supplements national administrative law. GDPR regulates any use of personal data and will require the result to be accurate and the public bodies to take any reasonable step to ensure erasure or rectifying of wrongful or inaccurate profiles generated by decision support system (Article 5(1)(d)). However, the basic motivation behind this regulation differs from the core of Danish Administrative Law. Where the rules and procedures of Danish Administrative Law intends to ensure that the executive power varies the will of democratic legitimated legislature, the GDPR holds an individual and rights-oriented focus. Thus, the GDPR's requirements of true and fair profiles is - roughly speaking – based on the assumption that misleading profiles in itself violates the individual.

In a legal context profiling means any form of automated processing of personal data consisting of the use of personal data to evaluate certain personal aspects relating to a natural person, in particular to analyse or predict aspects concerning that natural person's performance at work, economic situation, health, personal preferences, interests, reliability, behaviour, location or movements (Article 4(4)). If automated decision-making, including profiling, is used, the data subject are to be given meaningful information about the logic involved, as well as the significance and the envisaged consequences of such processing for the said person (Article 13(2)(f) and Article 12(2)(g)).

As decision support systems move towards supporting decision-making related to legal aspects, considered from a legal perspective a shift in relevant principles follows. If the function of the digital solution is no longer exclusively to generate facts to be considered when applying a norm, the above-described principles are no longer applicable. Such digital solutions aim to assist in determining *how* norms are to be applied to facts, legislation is partly or fully transformed into code and therefore, the principle of legality (rule of law) will be the relevant overall principle. Public authorities must stay within the boundaries laid down in the legislation as passed by the Parliament in order to respect the fundamental mechanisms of the democratic constitutions. This general principle is clarified and operationalized in Denmark - as in many Western countries – via case law, which in legal literature is gathered under a vague, unwritten principle of the use of (only) legitimate criteria. When authorities are required to clarify legislation in order to form a decision directed at a citizen, they are only to use criteria's directly or indirectly accepted by the legislative power. On the other hand, use of non-acceptable criteria are considered a violation of Administrative Law. A well-known example is that the legislature rarely accepts discrimination against women. Therefore, as a relatively simple example, the use of the decision support tool in the municipality of Frederiksberg, as described above in section 2, must not use the criteria gender as a factor when assessing whether a citizen has 'fair cause' to be absent from meetings or activities. Expressed positively, public authorities must strive to realise the intention of the legislator expressed through the legal sources. Expressed as a negation, authorities must not include criteria that are not directly or indirectly recognised by the legislator.

However, one might ask, are these relatively obvious distinctions relevant to the debate concerning transparency and explicability in the algorithm-controlled public administration? This theme is addressed in the next section, section 4.

4. Explainability

The Danish ethical principles of artificial intelligence set out in the National Strategy for Artificial Intelligence states in the fourth principle: "Explainability implies that one can describe, verify and restore data, underlying logics and consequences of the use of artificial intelligence, for example, by being able to track and explain decisions and decision-making support. [...] Public authorities have a particular responsibility to ensure openness and transparency through the use of algorithms."(Danish Ministry of Finance 2019).

This Ethical principle is to some extent a reflection of national administrative law, although the chain of mutual presuppositions and consequences within the regulation may seem quite complex. First, considerable caution is to be exercised in order to ensure that the design and functionalities of any digital tool supports compliance with relevant regulation (Fenger 2019). This requirement derives from the principle of administrative law by design and the requirement of a Good Administration Impact Assessment. Second, as pointed out above in section 3, the requirements of the technical design will vary in line with, among others, the said digital solutions impact on lawful administration and the decisions directed at citizens. Impact from flaws in design and incorrect programming *might* be effectively prevented via manual procedures. In other words, human case officers may prevent technical errors from having effect on the administration in the given field. However, this holistic flexibility does not fully apply in high risk areas.

For the fact-generating decision support systems, explainability in itself is not necessarily critical, seen from the perspective of administrative law as long as the digitally generated facts are objective and can be verified by caseworkers or courts, e.g. the presence of a particular type of vegetation in a given area. However, this is only a starting point. If assessments generated by artificial intelligence is used for automated decision-making, risk of unlawful administration increases, and requirements for design are tightened – and thereby a need for insight in the programming.

This might appear as a simple matter, but often requires a thorough legal analysis of the relevant legal framework. An illustration is the Danish Vaekstfonden's use of machine learning-based tools (the Danish state's investment fund) for automated decision-making. Vaekstfonden has developed several models to support the Fund's administration and is continuously developing more. Among these solutions is a screening model able to support the Fund's initial assessment of businesses applying for investments. Roughly speaking, the model can carry out the initial sorting of the many applicants according to the Fund's investment criteria (Moncur 2019). Since the output would affect the discarded applicants directly, the development of this model required thorough examination of the legal basis for the fund's activities and the legislature's intentions with the fund.

Relevant for the decision support system (the screening model) is that The Danish Growth Fund is a public company, established by law, aiming to promote growth in the Danish business community and benefit the Danish Society as a whole. See the Danish Growth Fund Act, Sections 1 and 10. Further, the intention is not to compete with private investors on equal terms, but to make risk-willing capital available in areas where the private market will not act without the Fund's support (Steno 2017).

According to the provisions in the Danish Growth Fund Act and the legislative history, the Fund's investment in a company must aim to promote growth in the Danish business community. Furthermore, Section 3, Subsection 3, of the Act requires the Fund to examine and emphasize environmental, social and administrative criteria. Finally, legislative history, provide a wide range of clues about the intention of the legislators with the Fund. Based on this material, the Fund has interpreted the legal requirements as a ban on weighing companies' geographical affiliations. Even though changes of success statistically is higher in the metropolitan areas, the Fund is given the task to ensure growth throughout all of Denmark. In other words, the Fund's legal basis set out a special prohibition against discrimination based on geographical location (Pedersen 2019). Consequently, the decisions support system for screening and sorting the applications had to be cleared of any criteria that would equal discrimination against companies outside metropolitan areas. This – of course - evoked a need for explainability.

From a legal perspective, another area of high-risk is use of artificial intelligence in a way that corresponds to digital processed judicial assessments. As it is mentioned above in section 3, the municipality of Frederiksberg will be obliged to ensure that the described decision support system does not use e.g. the criteria gender as a

factor when assessing whether a citizen has ‘fair cause’ to be absent from a meeting or an activity. In order to prevent such a hidden bias, the municipality needs insight in the programming – in other words explainability.

Finally, the GDPR will require explainability to some degree, since the data subject is given the right to ‘meaningful information about the logic involved’. Here insight in the programming is a prerequisite for providing such an explanation.

5. Summary and perspective

One of the most discussed risks of using artificial intelligence in the work of the public authorities is the risk of (systematic) administration in violation of democratically adopted legislation.

The government of Denmark has primarily used artificial intelligence to generate facts and assessments in the form of valuations or professional assessments. In other words, the use of decision-support solutions has primarily been related to the underlying facts used in administration and as a basis for decisions directed at citizens. Here, explainability is not necessarily needed from a legal perspective – at least not if the digitally generated data can be verified. Only high-risk use of artificial intelligence and risk of violation of human rights will lead to such requirements.

However, there is a development towards decision-supporting solutions related to legal aspect of Public Administration. On one hand, this actualises elements of the concerns raised in international and national forums. On the other hand, the fundamental principles of at least Danish administrative law and the measures contained therein already leads to requirements of transparency.

These distinctions might be useful in other areas of research, since they are closely linked to rule of law and the ideals of the separation of the legislative and executive powers, on which the social order of many other states is build.

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