

Introduction of artificial intelligence in Belgian court: failures, challenges and opportunities

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Abstract

The authors were recently granted a project in which they collaborate with judges from several jurisdictions in Belgium. The concrete goal of the project is to assist the Chambers for Distressed Enterprises in evaluating the economic prospects of selected enterprises. The implicit overarching goal is to introduce artificial intelligence in the Belgian legal landscape, an ambitious undertaking given that Belgium lacks behind most other European countries when it comes to digitisation in court. The project, as well as the background of the authors in artificial intelligence and law, puts them in a unique position to evaluate the failures, challenges and opportunities of the application of artificial intelligence in Belgian court. The obstacles that need to be tackled to prepare Belgian court for the era of an ubiquitous use of artificial intelligence, are illustrated by describing the seemingly endless efforts that are being made to introduce an online database that is to contain all judicial decisions. The observation that Belgian court operates, to some extent, in an archaic way, provides at once many opportunities for efficiency improvements by relying on artificial intelligence. This is illustrated by describing two specific potential applications of the use of artificial intelligence in Belgian court. The ideas and methods underlying these applications may as well find implementation in other judicial matters and in foreign jurisdictions.

Keywords

Digitisation, Belgian court, Distressed enterprises

1. Introduction

1.1. The introduction of AI in court happens at different paces in different parts of the world

Digitisation is an important building block for the development of artificial intelligence tools as it provides the necessary infrastructure and data. Across the globe, various initiatives have been taken to stimulate digitisation of the legal domain, some more ambitious than others. In China, the Supreme People's Court, endorsed judicial transparency and created the 'China Judgements Online' database in 2014 [1]. This database contains millions of nation wide judicial decisions that *can* be processed with AI. In the United States, digital transformation is rather driven from the bottom-up through state and federal court initiatives [2]. Consider the Case Management / Electronic Case Files system, better known through its interface PACER, developed by the federal judiciary. This tool provides public (but paid) access to federal court records and contains


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over 1 billions documents. Finally, in Europe, the 2016-2018 evaluation cycle of the European Commission for the Efficiency of Justice (CEPEJ) revealed that there is a *desire* in EU member states to make court decisions public [3]. However, it is unclear to what end the technical measures have been put into place to make open data possible.

In China, most technological expertise related to AI resides in the private sector, rather than in courts, according to Stern et al. (2020). Therefore, Chinese courts have been purchasing support from technological companies which enabled the rapid development of AI tools [1]. As to the United States, Coglianese & Ben-Dor (2021) argue that *"... no court is currently relying in any way, even on a human-in-the-loop basis, on what we would consider to be machine learning algorithms"* [2]. On the other hand, several analytical tools that do not rely on machine-learning but rather on statistical methods have been implemented to support decision-making in US courts. In Europe, there are a number of AI initiatives in the legal domain, e.g. Latvia is exploring the possibilities of machine-learning for the administration of justice. Furthermore, in the private sector, several LegalTech companies are providing AI-based services (such as Case Law Analytics, Doctrine and JurisData Analytics in France). However, as stated in the European ethical charter on the use of AI in judicial systems, these initiatives are not integrated in the public domain [3].

1.2. Purpose of the paper

Recently, we were granted a project¹ that has as purpose to support judges in the Chambers for Distressed Enterprises in the detection and evaluation of distressed firms. The judicial role of these Chambers is to safeguard creditor's rights. While we are currently still in the stage of developing some preliminary machine learning methods, it was clear that basic techniques and accompanying terminology are beyond the judges' background knowledge. Therefore, the specific purpose of the project described above, should merely be considered as a vehicle to introduce judges to the field of AI and to arouse enthusiasm in relying on ditto methods. Our project, and the lively discussions we had with judges in this context, provide an ideal opportunity to describe some peculiarities in the digital transformation of court in a small EU country that does not perform as one would expect from an otherwise highly developed country². We contribute to literature by (1) providing a non-exhaustive description of the state of artificial intelligence in Belgian court, positioned in a global context, and (2) discuss two potential applications of AI in court that can prove useful in the future, once the remaining challenges are met.

In Section 2 we describe the position of Belgium with respect to other EU countries in terms of using digital technology in court. Furthermore, we illustrate the struggles that are encountered in digitising Belgian court by describing the seemingly endless efforts that are being made to introduce an online database that is to contain all judicial decisions. Section 3 describes two specific potential applications of the use of artificial intelligence in Belgian court. The ideas and methods underlying these applications may as well find implementation in foreign jurisdictions.

¹Project web page: <https://researchportal.be/en/project/evaluation-distressed-enterprises-using-explainable-machine-learning-construction>

²E.g., in terms of the Human Development Index, Belgium ranks 17th among 186 listed countries, cf. <https://worldpopulationreview.com/country-rankings/hdi-by-country>.

2. Digitisation of Belgian court

The Next Generation EU fund is a European initiative to provide financial support to all member states to recover from the adverse effects of the COVID-19 pandemic [4]. At the beginning of 2021, the Belgian federal government selected projects to be executed in the context of this recovery strategy. One ambitious project is the so-called digital transformation plan for the judicial system, for which a budget of 100 million EUR has been allocated [5]. Actually, this may be yet another project that is declared to ensure a modernisation of the legal landscape, only to eventually conclude that many disparate peculiarities of the Belgian system hinder the full realisation of such projects. Our scepticism is based on the long history, still continuing to this date, of attempts to introduce an online database containing all judicial decisions. This history is an illustration of the discrepancy between ideas developed by legislative bodies and the actual realisation and acceptance by judicial bodies. We briefly describe this process in Section 2.2. But first we provide a short description of the relative level of digitisation, compared to the other EU member states, in Section 2.1.

2.1. The position of Belgium compared to other EU member states

Compared to the judicial systems in other EU Member States, the Belgian system is among the worse performing when it comes to digitisation. One noteworthy indicator for this statement is the EU Justice Scoreboard, which is an annual comparative information tool that was first launched in March 2013 by the European Commission [6]. In the context of this indicator, the European Commission collects data regarding the use of digital solutions in civil/commercial, administrative and criminal cases. One dimension of the scoreboard compares, over the member states, the possibility for various actors to use distance communication technology (such as videoconferencing) for procedures related to court cases [7]. Belgium is ranked 20th out of 27 member states. A more anecdotal illustration of the widespread digital illiteracy in the Belgian legal landscape is the fact that about 8 000 employees of justice in Belgium use a computer that is more than eight years old [5].

2.2. The arduous path in introducing an online database containing all judicial decisions

The first serious attempt to introduce digital methods in the Belgian judicial system came with the law of 20 October 2000³ for introducing the use of telecommunications and electronic signatures in judicial and extrajudicial proceedings. This law introduced the possibility for sending certain notifications via e-mail in the aforementioned kind of proceedings. Later, the law of 10 August 2005⁴ had as general purpose to anticipate a new judicial information structure by the introduction of the Phenix data system [8]. One of the more specific goals of this project was to ensure that all Belgian courts would rely on the same efficient computer application, motivated by the fact that at that moment 13 independent information systems were in use. In 2007 the project came to an abrupt end when the government terminated the contract with

³https://etaamb.openjustice.be/nl/wet-van-20-oktober-2000_n2000010017

⁴https://etaamb.openjustice.be/nl/wet-van-10-augustus-2005_n2005009652.html

the development company due to the company's underperformance [9]. However, another explanation for the failure of the project was its too ambitious character, as it aimed for a sudden and drastic change in the outdated technological infrastructure of the courts [10]. The law of 10 August 2005 also provided a legal basis for the introduction of a public database containing judicial decisions, called Juridat⁵. It was the only general, public and complimentary database that came into existence during that period. The severe disadvantage of this database was, however, that each court added decisions to this database at its own full discretion. On 3 October 2013, the database contained 145 279 judicial decisions [11], which is a disappointing number given that every year all Belgian courts together rule about 1 million cases.

In 2008 another major project was launched, called the Cheops project [12]. The name of the project, referring to the well known pyramid in Gizeh, was chosen to stress the stepwise approach that was envisaged in introducing new information and computer technology in court. In line with that approach, a limited number of courts were selected for an upgrade of their information systems, such as the justices of peace, after which other courts would follow. Even these more moderate objectives, compared to the Phenix project, could not be met. Technical constraints, such as the computer applications used by the justices of peace dating from 1992, entailed an unbridgeable gap with contemporary information systems. Furthermore, in the aftermath of the Phenix project, the justices of peace took on a critical attitude to be introduced, almost instantaneously, in a new era of information technology [10].

Another significant project, called JustX, was launched in 2012 [13]. The purpose was to interconnect certain databases in order to centralise the information related to a given case, such as identity data about the parties, judicial decisions, police reports, etc. A subproject of JustX that was regarded as ambitious was VAJA, which had as purpose to digitise all judicial decisions. Data related to the case, such as identity data, would be automatically entered in a template form for judicial decisions. However, in 2018 the minister of justice decided to abandon the project since the underlying technology became outdated [14].

The latest development in the digitisation process is the introduction of an online database that contains all judicial decisions, expected to be implemented at the beginning of 2023 [5]. Before even envisaging this implementation, several obstacles need to be overcome. For example, in 2019 the constitutional law was adjusted, since it stipulated that all judicial decisions are communicated in a public hearing. It now states that all judicial decisions are communicated publicly. In a first stage, only magistrates will have full access to the database. Only in a second stage, full access will be ensured to all individuals. The latter stage will be accompanied by pseudonymization of the names of private persons who are mentioned in the decisions. Measures will be taken to avoid that certain features, other than names, still permit identification of the concerned private person. These measures will be applied in an automatic way, but under human supervision. Another ongoing initiative is the Just-On-Web platform [15] that should become the point of access for civilians and enterprises to justice.

⁵In the meantime replaced by JUPORTAL, cf. <https://juportal.be/home/welkom>

3. Opportunities for the use of AI in Belgian court

In the previous section, we discussed the failures and challenges related to the digitisation of Belgian court. On a more positive note, in this section we describe the opportunities of artificial intelligence through two potential use cases: (1) the detection and evaluation of distressed firms in enterprise court and (2) sentencing speed penalties in police court. We have selected these cases as the research project, described in Section 1.2, allowed us to collaborate with judges, in particular judges from enterprise court. The insights in the working principles applied by the magistrates has led us to formulate these use cases, which we believe are illustrative for the tremendous positive impact that AI can have on the operation of the courts. Although the suggested applications are described with the Belgian context in mind, the use undoubtedly extends to courts in other countries.

3.1. Detection and evaluation of distressed enterprises

The goal of the project is to develop a tool that assists judges in insolvency proceedings. In Belgium, insolvency proceedings are described in Book XX of the Economic Law Code (ELC). The main idea of Book XX is that prevention is better than cure (art. XX.21-29 ELC). To accomplish this rationale, the Enterprise Court contains Chambers for Distressed Enterprises (art. XX.25 ELC), composed of one professional judge and several non-professional judges, with as task the evaluation of an enterprise's economic prospects upon notification of so-called "flashing lights" that indicate that the enterprise is encountering financial difficulties (as an example, one flashing light is that social security contributions have not been paid for two quarters). The evaluation will result in the dismissal of the case if the flashing lights are not alarming. If, on the other hand, the flashing lights are disturbing, the representatives of the enterprise can be summoned to court, with as purpose to start a dialogue on how to remedy the situation (in the spirit of "prevention is better than cure"). The conclusion of the evaluation could, however, also be that the enterprise is in state of bankruptcy, in which case the crown prosecutor will be notified (art. XX.29 ELC), who might subsequently sue in bankruptcy.

We had the opportunity to attend internal meetings of the Chambers for Distressed Enterprises, which allowed us to gain insight in the criteria used to evaluate the economic prospects of an enterprise. We believe that the employed methods are not efficient and there is much room for improvement. For instance, due to time constraints, the business data taken into account is limited. Furthermore, when handling the data, no computer input-output model was used and the process was guided by experience and heuristics. For example, in one of the Chambers, all companies with alarming flashing lights are sorted according to an arbitrarily selected flashing light each month. Depending on the available resources of the court that month, a relatively small number of firms is then selected for further evaluation and analysis.

A concrete goal of the aforementioned project is to build a tool capable of processing numeric and textual data from (mainly) annual reports that allows to rank companies according to bankruptcy risk. As a first step in the development of the system, a benchmark for the textual data scenario and several baseline models have been released. We have treated the task as an (imbalanced) binary classification problem and used bag-of-words techniques and a neural sequence encoder (the Longformer model [16]) as a way to represent the documents. For more

technical details, we refer the interested reader to our recent paper [17]. The final tool should ensure a significant reduction in the workload of the Chambers for Distressed Enterprises, as well as a more uniform evaluation of enterprises across different jurisdictions. Finally, the project will be valuable in fulfilling the goals of the “EU Directive 2019/1023 on preventive restructuring frameworks, on discharge of debt and disqualifications, and on measures to increase the efficiency of procedures concerning restructuring, insolvency and discharge of debt, and amending Directive (EU) 2017/1132 (Directive on restructuring and insolvency)”. According to article 3 of the Directive, Member States shall ensure that debtors have access to one or more clear and transparent early warning tools which can detect circumstances that could give rise to a likelihood of insolvency, and which then signal the involved debtor the need to act without delay. The developed system will exactly be such an early warning tool.

3.2. Sentencing speed penalties in the police court

The Belgian traffic landscape is divided into different zones, where for each zone a specific speed limit applies. For example, in built-up areas, which are typically densely populated, a speed limit of 50 kilometres per hour applies, unless there is a sign that indicates otherwise. Art. 29, §3 of the Road Traffic Law stipulates that speeding is sentenced with a fine between 10 EUR and 500 EUR. However, due to a peculiarity of the law, the pronounced fine needs to be multiplied by 8 to give the actual amount that the offender will be required to pay. Thus, the actual fine may vary from 80 EUR to 4 000 EUR. The law stipulates that “the judge takes the excess speed into account in determining the fine”, without specifying any relationship between excess speed and fine. The judge has, therefore, full discretion in determining an appropriate fine. Furthermore, art. 29, §4 of the aforementioned law stipulates that the fine may be reduced by the judge to an amount that is less than 10 EUR, without being smaller than 1 EUR, if the details of the case urge a milder fine. The law does not describe any specific circumstance that imposes the judge to grant such a reduction and to what extent such favourable peculiarities have an influence on the pronounced fine. The main consequence of the wide judicial discretion in matters of speeding is evident: case law across jurisdictions is non-uniform. Lawyers working in the domain of traffic law often know which judges are particularly mild or exceptionally strict. For litigants, however, it might be puzzling why they were sentenced a fine that is higher than the fine to be paid by a friend. High workload, combined with time constraints, are also factors contributing to confusing fines.

In recent work we describe how artificial intelligence might be used to reduce legal uncertainty in matters involving *ex aequo et bono* compensations, which refer to fair estimates of several kinds of damages that cannot be determined otherwise, in particular damages that relate somehow to prevailing moral or societal values [18]. We suggest to represent each case through a feature vector x and the assigned *ex aequo et bono* compensation as a random variable $J(x)$. Legal uncertainty can now be quantified through $L(\tau) = \left(\frac{\hat{\sigma}[J(x)]}{\bar{J}(x)} \right) - \tau$ with $\hat{\sigma}[J(x)]$ being the sample standard deviation and $\bar{J}(x)$ the sample mean of $J(x)$ and τ is a parameter that must be chosen. Intuitively speaking, we proposed to use previous similar cases as training examples to estimate an appropriate compensation amount for the case at hand, which reduces legal uncertainty essentially to zero. In order to avoid that compensations become out of sync with contemporary moral or societal values, we envisage an expert committee of judges that has the

authority to decide that the considered class of cases should, from that moment on, be handled by judges without support of the AI tool. From a machine learning point of view, this simply means that all training examples are discarded, and that a new training set is to be built up through judicial case law. It is only when case law has stabilised to a new equilibrium that the machine is again given the role of generating appropriate *ex aequo et bono* compensations.

This method might equally well be applied in generating speeding fines based on case law. The offender could still be given the possibility to bring forth arguments that relate to circumstances that are to his advantage and that justify a fine that is milder than the one suggested by the artificial intelligence tool. If the offender accepts the machine generated fine, the judge might simply approve it. Especially this latter case might entail tremendous benefits for the litigant. First, the case might be handled very soon after the speeding offence. Currently, it is no exception that even simple speeding cases are only handled one year after the offence. In this respect it is unsurprising that the law of 6 March 2018⁶ concerning the improvement of traffic safety extended the period of limitation from one to two years. Secondly, legal uncertainty would essentially be reduced to zero. The artificial intelligence tool might be made publicly available, such that litigants are able to verify the machine generated fine, given the details of the case, even before they are sued. Thirdly, a machine generated fine that is not contested, implies that the assistance of a lawyer is not needed, thereby avoiding additional costs that might otherwise be significant. Indeed, nowadays the assistance of a lawyer is frequently advised, even for undisputed offences, since an experienced lawyer knows which arguments are best raised in order to persuade the case-handling judge to rule mildly. Arguments that are dependent on the deciding judge are, obviously, useless in case a machine generates the fine.

4. Conclusion

Undoubtedly, the introduction of artificial intelligence in court would be beneficial to the judicial system. Efficiency improvements, reduction of legal uncertainty and lower costs for litigants are just some examples of the advantages that AI can bring. However, digitisation is an important building block that needs to be put in place before AI systems can be developed, as it provides the required infrastructure and data. All around the world, initiatives are taken to achieve this goal with China aspiring to become the global leader in this regard. When it comes to Belgium, a long history of digitisation efforts have proven to be a fruitless endeavour with different projects ending prematurely without achieving the foreseen goals. Despite the failures from the past, ongoing initiatives are trying to tackle the digitisation challenge, for instance, through the introduction of an online database containing all judicial decisions. As a way forward, we have discussed two potential applications of artificial intelligence in court. First, AI can be used in enterprise court for the detection of distressed enterprises. Such a system can lower the workload for the magistrates involved and ensure a more uniform evaluation of the enterprises. Second, legal uncertainty can be reduced in cases involving *ex aequo et bono* compensation such as speeding penalties handled by police court.

⁶https://etaamb.openjustice.be/nl/wet-van-06-maart-2018_n2018010649.html

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