Summary

Trendwatch

Introduction and first results of an instrument to improve the forecasts of the capacity needed in the justice system

This report provides a description of *Trendwatch*, an instrument to improve the forecasts of capacity needed in the justice system, and it presents the results of a first pilot with this instrument. With the new instrument, it will be possible to test specific forecasts on the basis of the most recent views and domain knowledge. The forecasts of capacity needed are currently primarily made by using a time sequence model: the PMJ (*Prognosemodel Justitiële Ketens*, Forecasting Model for the Judicial System). In the *Trendwatch* development project, the results of a recent evaluation of the PMJ played a central role. This evaluation revealed that this model can hardly be used, if at all, to predict structural breaks in trends. The main objective of the project was therefore to develop a method and an organisation that could be used to identify topical relevant factors, and to predict any structural breaks in trends of the capacity needed in the justice system.

Both in the developmental stage of *Trendwatch* and in providing a framework for the pilot cases that will be discussed in this report, the focus was on problems that partly explain why such structural breaks in trends are so difficult to predict. The first consideration in this context was that changes and drastic events are continually taking place, both inside and outside the complex justice system, which may influence the capacity needed by the organisations in this system. Consideration must be given to mechanisms - for instance, behavioural mechanisms (e.g. an increased inclination of judges to impose sentences), which occur in reaction to their surroundings, or their *context* (e.g. a social call to impose more severe punishments). Such mechanisms may exert an influence both inside the justice system (e.g. among public prosecutors, judges, and pro Justitia experts) and outside the justice system (e.g. among policy makers, citizens, and offenders). To put it briefly: the conditions are variable. A time sequence model such as the PMJ, on the other hand, relies strongly on the assumption that correlations from the past will also be valid in the future, which makes such a model predominantly suitable under stable conditions.

As there are often no usable statistics or empirical data available to substantiate and predict changeable *factors* (such as contexts and mechanisms), *Trendwatch* includes the most recent views on such factors in the forecasting process. In this context, the emphasis will be on the conduct of the participants in the justice system and the input at the beginning of the justice process, which is difficult to predict (such as the inflow of cases through the police). In addition, the instrument is partly a reaction to several recommendations from the evaluation of the PMJ, including the recommendations to attempt to identify 'critical forecasts'; to strive for a more frequent monitoring of the latest developments inside as well as outside the justice system; to make use of the critical views of independent experts; and to be aware that users often regard existing models as black boxes, which makes it difficult for them to judge the reliability of the forecasts.

The instrument

Two important organisational aspects of the instrument developed are identification on the one hand, and registration and documentation on the other hand. The information sources that are currently collected include documents of justice departments, agencies and policy departments; *expert opinions* on the basis of interviews and questionnaires (approximately 60 experts are as of now involved with *Trendwatch* for this purpose); scientific publications; and news and communications from the media, supervisory bodies and trade organisations. In addition, data and views are collected through activities of project team members within the justice system. In order to be able to store large quantities of information and domain knowledge, and to be able to make it accessible again later on, a database is being developed. This database will link the source material collected to relevant factors that have already been defined. In this way it will be possible (1) to monitor which relevant developments occur according to which sources; (2) to record how changes and events inside and outside the justice system exert influence; and (3) to provide for accountability.

As *Trendwatch* is in a pilot stage, the focus of its development has only been on the organisations in the *security system*. Forecasts for the administration of justice in civil and administrative cases and legal aid in civil cases are thus excluded for now. During the first pilot of the instrument, attention was furthermore only paid to factors influencing the *workload* of the organisations in the justice system.

In the method developed for *Trendwatch*, a *benchmark trend*, which is a current trend in the workload or of the capacity needed by an organisation in the justice system, serves as reference. The period in which a benchmark trend occurs is the so called *benchmark period*. A benchmark trend usually starts at the end of a *historical trend*, that is, after a structural break in a trend in a time sequence. In this context, it is assumed that each trend is the result of a nearly stable combination of causal factors. A benchmark trend is consequently often caused by a structural change in such a combination, which may be ascribed to one or more *explanatory factors*. These factors are relevant factors, the development of which has changed during, or just before, a benchmark period.

On the basis of these conceptual assumptions, the method has combined two different reasoning tasks: explanation and prediction. First of all, this has made it possible to explain a benchmark trend. This explanation can subsequently be used to predict the future course of a benchmark trend. In these two forms of reasoning, several cause and effect relationships are usually established. With this in mind, trends are thus always explained in terms of causal sequences of relevant factors. This is done by using *argument diagrams*. These diagrams provide structure in large quantities of information, and make assumptions and reasoning with regard to reality more explicit. Such diagrams are consequently very useful in the absence of statistics and empirical data that could be used to effectively substantiate explanations and predictions. This absence of ‘hard facts’ is frequently the case with respect to variable trends in the justice system.

The entire process of explaining and predicting will take place during a *Trendwatch* process. Each *case* in such a process includes (1) a current benchmark trend during a specific benchmark period, as the result of a structural change in a combination of causal factors; (2) all factors that can explain this change - and thereby the benchmark trend itself; and (3) a prediction of the direction of the benchmark trend in a specific *expectation period*.

The selection of a case is made on the basis of five considerations that may contribute to the identification of critical forecasts. The considerations that have been formulated are the following: (1) the scope of the costs incurred by an organisation in the justice system; (2) the social, political and administrative importance of a correct forecast; (3) the prediction error of the related policy-neutral forecasts of the PMJ in the past; (4) the extent to which a feasible benchmark trend has been predicted by the PMJ; and (5) the extent in which explanatory factors (or possible explanatory factors) that have been identified earlier have already been taken into consideration in the PMJ.

For each case in a *Trendwatch* process, the following three different argument diagrams will be made step by step: (1) the *basic diagram,* a 'provisional' diagram that explains the cause and direction of a current benchmark trend; (2) the *reference diagram,* a diagram that has been calibrated on the basis of *expert opinions* and which explains the cause and the direction of a current benchmark trend; and (3) the *prediction diagram,* the diagram – built on the basis of the reference diagram – which explains in detail the expectations about the factors included in this diagram.

All these diagrams represent the structure of an explanation in the form of a tree or graph that is made up of boxes and arrows. The boxes in the diagrams represent factors, while the arrows visualise the causal relationships between the factors. In the diagrams, there is a significant difference between factors and *arguments*. The further the causal sequences are developed in a diagram, the more detailed the factors included in the tree will be. Somewhere, the points will be reached where it is no longer desirable – or no longer possible – to specify the explanatory factors for these factors any further. A factor that is not explained explicitly by one or more other factors, and which is consequently positioned at the beginning of the causal sequence(s), is therefore also referred to as a *ground factor*. Arguments, which are constructed on the basis of *expert opinions*, make it possible to still make a statement about such ground factors.

The argument diagrams can be used to carry out calculations, for each factor has a value expressing the validity or the development of the factor. In order to obtain insight into the extent to which one factor explains the other factor, a value is also assigned to each causal relationship which expresses its *explanation strength*. The practice of calculation through a diagram is carried out with arguments as input. The value of a ground factor may be determined on the basis of different types of arguments. This value gives an indication of either the validity or the future development of a ground factor. By calculating through an argument diagram, it will subsequently be possible to determine the values for all the other factors included in the diagram, including the value of the benchmark trend that is to be explained. The outcome of a basic diagram or reference diagram thereby represents the extent to which an explanation for a benchmark trend is supported. The outcome of a prediction diagram, on the other hand, gives a *trend indication*: this is a prediction value that indicates whether and, if so, in which direction the benchmark trend will change in an expectation period.

Each year, several cases will be considered for a *Trendwatch* process. The basic structure of such a process consists of two phases in which the following nine steps may be distinguished. The first phase concerns the *preliminary investigation*: (1) data collection, listing and analysing the relevant factors that may explain the current benchmark trend; (2) mapping out the factors and their interrelationships in a basic diagram on the basis of the domain knowledge that is present within the

project group; (3) establishing the facts, inaccuracies and uncertainties in the basic diagram during successive project group meetings; (4) adjusting the basic diagram on the basis of new substantive insights and methodical grounds. The second phase concerns the *expert phase*: (5) consulting experts by means of questionnaires; (6) listing and analysing the *expert opinions* on the basic diagram collected in this way; (7) sharpening the findings into a definitive reference diagram; (8) listing and assessing *expert opinions* on the expected future development of explanatory factors; and (9) drawing up and calculating through a prediction diagram and specifying the details of the trend indication.

The outcome of a *Trendwatch* process will be an independent indication of the expected level of the workload of an organisation in the justice system at the end of the expectation period. This indication may be used by the project group that is engaged in the annual updating of the PMJ to test and/or adjust the policy neutral capacity forecasts.

First results

By way of initial trial, *Trendwatch* has been used in two pilot cases for the criminal capacity utilisation rate in: (1) the adult prison system and (2) the youth custodial institutions. With regard to both cases, an expectation of the criminal population in 2015 was the most significant product of the process that was followed. In addition, details were provided about the factors that were most determinative for these expectations, and the accompanying uncertainties were labelled.

In the adult prison system, the number of persons with a criminal ground for detention sharply decreased in the period of 2005-2009: from an average of 14,108 persons in 2005 to an average of 11,092 persons in 2009. The trend that has manifested itself since 2005 has been used as benchmark trend in this case. On the basis of a *Trendwatch* process, a criminal capacity utilisation rate of approximately 8,875 persons is expected in 2015. An uncertainty margin has been established with 10,521 as the upper limit and 7,196 as the lower limit. This prediction points suggests that the criminal population in the adult prison system will continue to decrease until 2015, but that this decrease will proceed at a clearly slower rate than before. The forecast has been based on the expectation of experts that the development of multiple factors that determined the downward trend between 2005 and 2009 will level off. After many years of increase, the prediction is a stabilisation of the use of sanctions that do not actually result in the deprivation of liberty by means of detention. Expert opinions also indicate that the activity and active prosecution of smugglers of cocaine at Amsterdam Airport Schiphol will remain at the current level and will not decrease any further. With regard to another important factor, namely the broad efforts to tackle the problem of habitual offenders, it was argued that the recent intensification of such efforts will not proceed any further.

In the youth custodial institutions as well, the number of persons with a criminal ground for detention sharply decreased in the period of 2005-2009: from an average of 1,166 persons in 2005 to an average of 713 persons in 2009. On the basis of the *Trendwatch* process, it has been predicted that – in 2015 – the population of the youth custodial institutions will be approximately 478. An uncertainty margin has been established with 646 as the upper limit and 311 as the lower limit. This prediction suggests that the criminal population in the correctional institutions for young offenders will continue to decrease until 2015, but that this decrease will proceed at a rate that is substantially slower than before. The forecast has been based on the expectation of experts that the development of multiple factors that

determined the downward trend between 2005 and 2009 will level off or that it will even reverse in a number of cases. In summary, it has been predicted, for a variety of reasons that – compared to the image of secure youth care – an improvement of the image of the correctional institutions for young offenders will be observed, although this improvement may be slight. The amount of attention paid to care and treatment in the justice system is furthermore not expected to increase further, at least not to any great extent. In addition, it has been predicted that the recent decrease in the number of cases that have been prosecuted and which have a bearing on the correctional institutions for young offenders will, in the next few years, occur at a slower rate.

The pilot phase has demonstrated that the *Trendwatch*-instrument currently consists of a usable method and organisation to identify topical relevant factors and to predict (possible) structural breaks in trends. Both organisationally and methodologically, there is however still room for various improvements.