Bail Decision Support System

Onyeka Uche Ofili

---**ABSTRACT**---
This paper is an improvement on previous work especially the work done by Patricia Hassett It has a more expended scope and suggests new technological tools and designs for the bail decision support system. It adapts lessons from effort made in decision support systems for the sentencing domain. And it incorporates new technological developments such as the neural network into the design of a comprehensive decision support system for the bail domain. The end result is a robust and novel bail decision support system design, with detailed systems and user requirements. The decision support system as proposed in this paper should be built on open architecture, should be easily upgradeable, should have a simple interface, built on web technology and easy to use.

Date of Submission: 04 August 2014   Date of Publication: 15 August 2014

I. INTRODUCTION

Even though bail decisions seem an obvious choice for decision support systems considering its size (it is a domain that is not too broad) and the challenges it has faced in the past and in recent times, there is yet to be robust computer software designed for this purpose. Some of these challenges include; the very limited time within which a bail decision maker has to reach a decision, wide disparity in bail decisions for similar cases and lastly lack of documentation of the proceedings and outcome of bail decisions. [1]

Notable among the previous efforts in developing support systems in this domain is the work by Patricia Hassett [1992][2]. She developed a prototype bail decision support system focused on addressing the concern of failure to reappear for summary offences punishable by imprisonment up to six months. Her effort, which although was a prototype, was not implemented. This may not be unconnected to the often misalignment between academic researchers in the area of Artificial Intelligence (AI) and law and front-line practitioners. It could also be that society was not ready for adoption and application of such technology in the bail domain at the time.

This dissertation will attempt to improve on the work done by Patricia Hassett by expanding the scope and suggesting new technological tools and designs for the bail decision support system. It will aim to adapt lessons from effort made in decision support systems for the sentencing domain. And also try to incorporate new technological developments such as the neural network into the design of a comprehensive decision support system for the bail domain. The end result is a robust and novel bail decision support system design, with detailed systems and user requirements.

Section 2.0 of this paper looks at an overview of bail decision support system; meaning of bail, breach of bail and the challenges the bail system is facing. Section 3.0 analyses some existing sentencing decision support systems and how they can be used to model a bail decision support system. Section 4.0 looks at the risks involved in making bail decisions, and subsequently proposes a sound structure and design for bail decision support system (BDSS). The paper finally concludes in section 5.0.

II. OVERVIEW OF BAIL SYSTEM

In developing a BDSS it is imperative that one understands the bail system including the bail process, the requisite laws, the consequences of breaching bail and the challenges facing the bail system.

---

[1] P. Hassett, 'A Prototype Expert System For Making Bail Recommendations', (1992) 7th BILETA Conference, Information Technology and Legal Education: Towards 2000, 9th & 10th April 1992
[2] Ibid

Bail is the provisional release granted to a suspect while waiting for trial.[3] It is an undertaking entered into by a suspect with a court or police in which the suspect agrees to appear in court at an appointed date and also comply with every other conditions and terms that may be attached to the bail.[4] There are three types of bail; police bail, police to court bail and court to court bail.[5] Police bail is when someone is arrested and later released due to insufficient evidence for charges to be brought against him. The police can then use the time for which the accused is on bail to carry out further investigation into the offence before making a final decision. Before the accused is granted bail he will be interviewed and subsequently be issued a form which will state when and where to return to answer the bail.[6] Police to court bail is when the accused has been charged with an offence and granted bail to return to the court at a specified date. Court to court bail is when a court grants a defendant the permission to go and return to the court or another court at a specified date. In applying for bail it is usually required that the application be made in writing, provide the names and addresses of any sureties, state the offence, proposed address if granted bail and name of householder.[7]

Once an alleged criminal is charged he may be released on bail[8] except where it is believed that (see Schedule 1 to the Bail Act 1976):
1.   There is doubt about his identity and address;
2.   It is in his interest and/or the interest of somebody else that he be remanded;
3.   There is a strong likelihood that he may abscond and fail to appear in court;
4.   There is a strong possibility that while on bail he may obstruct the smooth administration of justice; and
5.   There is a reasonable ground for the court to believe that while on bail he may commit further crime.

Bail may also be denied to a defendant who is charged with murder, attempted murder, manslaughter, rape or attempted rape. Section 25 of the Criminal Justice and Public Order Act 1994 provides that if the

---

[3] Paralegal Advisory Service (PAS), 'What is bail?' (2004)
<www.penalreform.org/resources/bro-2004-what-is-bail-en.pdf> accessed 16/05/2009

[4] Legal Services Commission, 'What is bail?' (South Australia, Law handbook)
<http://www.lawhandbook.sa.gov.au/ch02s03s01.php> accessed 6 June 2009

[5] Dorset Police Force, 'Bail Conditions'
<http://www.dorset.police.uk/default.aspx?page=1024> accessed 16 May 2009

[6] Patricia M Morgan and Paul F Henderson, 'Remand decisions and offending on bail: evaluation of the Bail Process Project' (London: Home Office, 1998) Home Office Research Studies
<http://www.homeoffice.gov.uk/rds/pdfs/hors184.pdf> accessed 18 May 2009

[7] If a criminal case is brought before the crown Court and the defendant wishes to file for bail while waiting for the case to reach a conclusion, he will have to apply for bail and fill out form B (Notice of application for bail, the court of appeal criminal division, Criminal Appeal Act 1968, (*Criminal Procedure Rules, r.68.8(2)*)) as part of the bail application process. If the application for bail is following grant of conditional police bail see the bail application procedure as stated in article 84A of the Magistrates' Courts Act 1980 (Magistrates' Courts (Amendment) Rules 1995).

[8] Section 4 of the Bail Act 1976 provides that bail shall be granted to:
4(2) (a) To a person who appears or is brought before a magistrates' court or the Crown Court in the course of or in connection with proceedings for the offence, or
4(2)(b) To a person who applies to a court for bail or for a variation of the conditions of bail]in connection with the proceedings.
4 (3) To a person who have been convicted of an offence, appears or is brought before a magistrates' court to be dealt with under [Part II of Schedule 3 to the Powers of Criminal Courts (Sentencing) Act 2000 (breach of certain community orders)].
4(4) To a person who has been convicted of an offence and whose case is adjourned by the court for the purpose of enabling inquiries or a report to be made to assist the court in dealing with him for the offence.

defendant has previously been convicted of any of the above mentioned crimes in the past he will not be granted bail except for very exceptional grounds. This has been thought to be in conflict with the provisions of Article 5 of the European Convention on Human Rights. However, it was clarified that these two provisions are not in conflict in *R(O)* v *Harrow Crown Court* (2003) *The Times*, 29 May by Kennedy LJ.[9]

Bail may be granted with conditions or without conditions attached. The police and court can impose conditions to bail granted for several reasons. It could be to ensure that the accused returns to court at an appointed date, to ensure that the accused does not go out and disrupt or interfere with witnesses whiles on bail or to prevent the accused from committing further crime. Some of the conditions imposed could be to restrict the accused movement by asking him not to move out of the town where the crime was committed or asking him not to move within certain distance to a witness residence or office. Curfew may be placed on him requesting that he does not stay outside his house beyond a given time and does not leave his house before a set time. On the other hand the court can grant an unconditional bail to a defendant where and when it is convinced that the defendant will return to court at an appointed time. And that while on bail he will not try to disrupt the administration of justice on that particular case or indeed any other case for that matter and that he will not commit further crime.[10]

2.1 Breach of Bail

It is an offence for a person to fail to show up in court on the agreed date or violates any of earlier stated bail conditions where applicable. For instance, it is an offence for the person when asked not to travel outside a given geographical location to do so without the knowledge and consent of the court. If the person is found guilty of not adhering to the terms and conditions of bail it may lead to his immediate arrest and the bail withdrawn. The person may end up being remanded in custody and may not be granted bail in future or stricter conditions may be imposed on him. It is generally considered a criminal offence to breach bail. Section 6 of the Bail Act 1976 subsections 1and 2 provide that: (1) if a person who has been released on bail in criminal proceedings fails without reasonable cause to surrender to custody he shall be guilty of an offence; (2) if a person who has been released on bail in criminal proceedings, and having reasonable cause therefore, has failed to surrender to custody, fails to surrender to custody at the appointed place as soon after the appointed time as is reasonably practicable he shall be guilty of an offence.

In a situation where the accused believes he has good enough reason that prevented him from surrendering to custody, s6 (3) of the Act provides that it shall be for the accused to prove with substantial reason that he has justifiable reason for not surrendering to custody. Where a person is found wanting with respect to subsections 1 and 2 of Section 6 the offence is punishable under subsection 5 of the same section, either on summary conviction or as if it were criminal contempt of court.

2.2 Challenges of the Present bail System

Having a functional and effective bail system is very important in every society. The bail system should not be too lax neither should it be too rigid and insensitive to allow innocent citizens suffer under detention. The challenge therefore, is to have a bail system that carefully marries these two concerns together; a system that is able to reduce risk to the public while protecting the rights of the citizen, including the right to freedom unless convicted.

The then shadow Justice Secretary, Nick Herbert, in 2008 suggested that the bail system was too weak.[11] The conservatives generally argue that the public interest be given more attention in bail decisions. This view is in line with the call by Scotland Police chiefs in May 2005 on the then Justice Minister, Cathy Jamieson, to get tougher on criminals who commit crimes while on bail. At the time it was recorded that more than 21,000 offences have been committed by people on bail in the Strathclyde Police area alone within a period of one

---

[9] Robert Jago, 'Civil and Criminal Procedure'
<http://www.londonexternal.ac.uk/current_students/programme_resources/laws/subject_guides/civ_crim/criminal_procedure_ch11.pdf> accessed 8 June 2009

[10] Criminal Justice System, 'Upholding the Rights of the Defendants'
<http://www.cjsonline.gov.uk/defendant/bail/> accessed 18 April 2009

[11] Michael White and Andrew Sparrow, 'Conservatives unveil plan to reform bail system' Guardian (London 11 August 2008)
<http://www.guardian.co.uk/politics/2008/aug/11/justice.conservatives> accessed 17 May 2009

year.[12] Further evidence in support of this view can be seen in the report that 60 out of the over 450 (that is about 13 percent) murder suspects charged in 2008 were bailed after being charged. And also four out of every five violent crime suspects gets bail[13].

Nick Herbert was of the view that the fee of £60 for failing to answer bail was too small and insufficient for not showing in court at the due date. He further thinks that defendants are easily granted bail, bail is breached frequently and the enforcement of bail rules is wanting. Having a lax bail system is against the public interest as the criminals who are easily let go free may go back to commit more crime while on bail. This may affect the confidence which citizens have on the general judicial system. Gordon Brown instigated that the bail policy should be reviewed following the killing of his mother-in-law and himself by a former police inspector, Garry Weddel, while out on bail.[14] If this incident is anything to go by one would recommend a stricter bail policy and possibly having a blanket bail system. However, having a blanket bail policy, will result to breach of human right and go against the principles of human right laws[15]. Article 5(1)(c) of the European Convention on Human Rights and Fundamental Freedoms provides that everyone has the right to liberty and security and no one shall be deprived of this right except in the following instances: the lawful arrest or detention of a person effected for the purpose of bringing him before the competent legal authority on reasonable suspicion of having committed an offence or when it is reasonably considered necessary to prevent his committing an offence or fleeing after having done so. Furthermore, Article 6 of the Convention provides that everyone has a right to fair trial. Bail decisions should therefore, be treated on a case by case basis.

The judicial system as pointed out above should not adopt a blanket bail policy. Remanding people unnecessarily will also put more pressure on the prisons. Overcrowding of prisons had already become a major headache to the UK government. [16][17][18] Unfair detention of defendants and over crowding of prisons has been reported to be one of the causes of prison suicide in UK.[19] The bail system is partly blamed for this problem.

---

[12] The Journal Online, 'Bail system in crisis, say police chiefs: Conference call to Executive for crackdown on bail offenders' The Journal Online (London 20 May 05)
<http://www.journalonline.co.uk/News/1001851.aspx> accessed 4 July 2009

[13] Michael White and Andrew Sparrow, 'Conservatives unveil plan to reform bail system' Guardian (London 11 August 2008)
<http://www.guardian.co.uk/politics/2008/aug/11/justice.conservatives> accessed 17 May 2009

[14] Ibid

[15] The Law Commission, 'Criminal Law: Bail and The Human Rights Act 1998: A Summary' (1999) Consultation Paper NO 157
<http://www.lawcom.gov.uk/docs/cp157sum.pdf> accessed 17 May 2009

[16] BBC News, 'Prison overcrowding 'at crisis point'' BBC News (London Wednesday, 28 August, 2002)
<http://news.bbc.co.uk/2/hi/uk_news/2222022.stm> accessed 20 May 2009

[17] Sophie Goodchild, 'Public at risk from prison overcrowding' The Independent (London Sunday, 21 January 200)
<http://www.independent.co.uk/news/uk/crime/public-at-risk-from-prison-overcrowding-433075.html> accessed 20 May 2009

[18] Alan Travis, 'Overcrowding blamed for rise in prison deaths' The Guardian (London Saturday 22 September 2007)
<http://www.guardian.co.uk/uk/2007/sep/22/ukcrime.prisonsandprobation> accessed 20 May 2009

[19] Nigel Morris, 'Rise in prison suicides blamed on overcrowding' The Independent (London Friday, 17 June 2005)
<http://www.independent.co.uk/news/uk/crime/rise-in-prison-suicides-blamed-on-overcrowding-494408.html> accessed 19 May 2009

The unnecessary remand of defendants is seen as one of the major causes of the rise in the prison population.[20] Juliet Lyon, Director of the Prison Reform Trust, said: "This catalogue of deaths must act as a terrible warning to the courts to avoid custody for those who are vulnerable or mentally ill, and a stark wake-up call to Government to act now to improve court diversion, bail provision and treatment options and, at long last, to end prison overcrowding."[21]

Another challenge facing the bail systems is the fact that magistrates have very limited time within which to make a bail decision. This leads to inconsistency in bail decisions (a major human right concern, see above), lack of proper documentation and no time to adequately reference past similar instances. The issue of inconsistency in bail decisions is not only peculiar to this domain but also to the sentencing domain, a domain which has some similarities to the bail domain. In fact U.J Schild (1998) argues that in the domain of criminal sentencing that it is possible for a judge to arrive at different conclusions even under identical conditions. It all basically depends on what the judge has at the back of his mind to achieve. The judge may arrive at a different conclusion if rehabilitation is what he has in mind and may arrive at a different conclusion in terms of sentencing if deterrence is what he has in mind.[22] Furthermore, K. White (2004) argues that similar crimes may end up with different sentences and one factor that has to be taken into consideration is societal expectations.[23] This situation is quite similar to what obtains in the bail domain. A research carried out in 2004 in New York using courtroom observations complemented with the state's Criminal Justice Agency databases revealed that some factors influence the bail decision reached by judges[24], see section 4.1.2 below. In reaching his decision the judge may not only consider the likelihood of the defendant fleeing but also the possibility of pre-trial crime or he may choose to deny the defendant bail as a mark of pre-trial punishment.[25]

The foregoing arguments are not out of context but there should be more consistency in decisions reached by judges including bail decisions. This can be achieved by the use of decision support systems specifically suited for the bail domain. This system will also provide judges with accurate information and help them make faster and more informed decisions. This decision support system should in no way impair the freedom or independence of judges.[26] And it does not imply that judges will no longer be subjective on matters pertaining to bail but they will carry out bail decision based on facts and accurate information made readily available to them through the bail support system.[27] And even though the sentencer may have the discretion and

---

[20] Prison Reform Trust, 'Five ways to stem prison overcrowding', October 2005
<http://www.prisonreformtrust.org.uk/subsection.asp?id=349> accessed 20 May 2009

[21] Nigel Morris, 'Rise in prison suicides blamed on overcrowding' The Independent (London Friday, 17 June 2005)
<http://www.independent.co.uk/news/uk/crime/rise-in-prison-suicides-blamed-on-overcrowding-494408.html> accessed 19 May 2009

[22] U. J Schild, 'Criminal sentencing and intelligent decision support', (1998) 6 Artificial Intelligence and Law, volume 6: *151*

[23] K. White, 'From 'Knowing' to Legal Knowledge: Using Early Twentieth Century Canadian Murder Trials to Problematize Knowledge Management Technology' (2004) CAUT Law Forum - Winnipeg, 2004

[24] Mary T. Phillips, 'Release and bail conditions in New York' (2004) New York City Criminal Justice Agency, Research brief No. 6, August 2004
<http://www.cjareports.org/reports/brief6.pdf> accessed 7 June 2009

[25] John S. Goldkamp and Michael R. Gottfredson, 'Bail decision making and pre-trial detention Surfacing judicial policy' (2005) Springer Netherlands, Law and Human Behaviour

[26] U.J. Schild, "Criminal sentencing and intelligent decision support", (1998) Artificial Intelligence and Law, volume 6: *151*

---

the last say in deciding whether a suspect may be granted bail or not it is an offence for him to do so with the wrong motives, maliciously, unlawfully or without substantial reason or probable cause, see Linford v Fitzroy (1849) 13 QB 240 at 247; R v Badger (1843) 4 QB 468 at 472 and Osborne V Gough 3 B & P 551.

2.2.1   Problems with the Bail Act

Schedule 1, part 1 Article 2 of the Bail Act, 1976 provides that a defendant should not be granted bail if the court is satisfied that there are substantial grounds for believing that the defendant if released on bail would fail to surrender to custody, commit an offence while on bail, and interfere with witness or otherwise obstruct justice be it in relation to himself or someone else. The Act did not clarify on what is meant by 'substantial grounds for believing'. It did not in itself provide in explicit terms what constitutes relevant 'grounds for believing'. The law commission have argued that requirements as to what constitutes 'substantial grounds for believing' should be added to the Act.[28] There is no body of judicial rules which one can point at that supports or provides reasonable explanations for determining 'grounds for believing'. It is unlike other aspects of law where history of judicial rules provides substantial guidance. However, efforts are been made to address this sort of gaps in legal documents, ranging from the use of mathematical models[29] to Larry Laudan's reform proposal which suggests that focus should be on objective evidence in place of jurors' subjective viewpoint.[30]Some of these proposed solutions could be adopted for the bail domain.

The UK legal system relies on case-based reasoning as a guide to determine present and future cases[31]. This is referred to as the doctrine of *stare decisis*. That is the outcome, rulings, in previous cases of similar nature are used as guide to decide present cases, invariably like cases should be treated alike. Even though bail decisions are not usually discussed in the context of *stare decisis*, the same moral perception applies: courts deviating without reason in their bail decisions from established practice violate one of the most fundamental tenets of justice.

Case-based reasoning for now is not as effective in bail system as it is in other legal domains. The reason for this include the fact that in bail decisions, there are no mechanism for properly documenting the proceedings and decisions reached and the reasons for which such decisions were taken. The time frame from start to finish for a bail case is usually very short. And the courts have not really had reasons enough to put in place mechanism for documenting the proceedings perhaps due to time constraint and the volume of bail cases that need to be addressed within the very limited time.

Part of the principles of the *stare decisis* doctrine is the respect and regard given to past judgements made by higher courts (appellate courts) over lower courts. A lower court is bound by the decisions of a higher court. In bail systems it is not very often that you see bail decisions appealed to higher courts. The reasons are still within the major challenges of the bail system, the time for hearing a case is too short and there is no proper documentation. For a decision to be appealed you need to show convincingly that the decision reached by the lower court lacked merit.

In the absence of rules on a particular subject by a higher court, a lower court can decide to rely on previous rules by another court of equal level. Such reliance by a court on another court of equal status is

[27] Samantha Besson, 'Four Arguments Against Compromising Justice Internally', (2003) Oxford Journal of Legal Studies, 1 June 2003

[28] The Law Commission, 'Bail and the Human Right Act 1998: Executive Summary' LawCom No 269, <http://www.lawcom.gov.uk/docs/lc269sum.pdf> accessed 5 June 2009

[29] Thomas F. Gordon, Henry Prakken and Douglas Walton 'The Carneades Model of Argument and Burden of Proof' (2007) <http://www.dougwalton.ca/papers%20in%20pdf/07GordonPrakkenWalton.pdf> accessed 4 August 2009

[30] Larry Laudan, *Truth, Error, and Criminal Law: An Essay in Legal Epistemology,* (Cambridge Studies in Philosophy and Law, CUP, Cambridge 2005)

[31] Sharon Hanson, *Legal method and reasoning,* (2nd Edition Cavendish Pub Ltd, London 2003)

usually motivated by the degree of persuasiveness of the rulings in the case. But the same challenge will be encountered within the bail domain. Even though courts at the same level may have made bail decisions on similar matters there may be no documentation on the outcome of those cases.

This lack of substantial record of past cases is a major challenge to the construction of a robust expert system for the bail domain. Although, this challenge is not impossible to overcome in building an expert system for the bail domain but it must be taken into consideration by all means in designing such system.

III.   SENTENCING DECISION SUPPORT SYSTEMS

Not too much work has been done in the area of developing expert systems or decision support systems in the bail domain; in fact the effort in this area is very sparse. This is however, not the case for the sentencing domain even though it shares a lot in common with the bail domain. This section will start by looking at the general challenges facing the sentencing domain. It will then go further to look at the progress made and challenges encountered in designing and deploying decision support system in the sentencing domain. It will also consider how the lessons learnt from the sentencing domain can be adopted and applied in the design of a decision support system for the bail domain. Since we will argue that it is possible to transfer most if not all of the ideas from sentencing support to bail decision support, we will now discuss sentencing support systems in some length starting with the challenges facing the domain.

One of the challenges facing the sentencing domain is the complaint that there are a lot of disparities in the sentencing decisions made by judges. And this is attributed to the plenty of room given to judges to use their initiatives and the challenge posed by huge statutory provisions which the judges have to come to grips with. Another problem is variation in content and scope and variation in quality of the information presented before the Court and for which decision has to be based on.[32] Other reasons for lack of uniformity in sentencing are due to different sentencing aims and different judges assigning varying weight to each sentencing aim. These challenges as is in the sentencing domain are very similar to the challenges in the bail domain see above.

In solving the earlier pointed challenges in the sentencing decision system various jurisdictions have adopted strategies and methods which they consider suitable for their particular society. Some states in the US, such as Minnesota, for example have adopted sentencing guidelines.[33] The US Sentencing Reform Act of 1984 forms the foundation for the Federal Sentencing Guideline[34] as seen today. The guidelines provide sentencing ranges for various crimes. However, in U.S. v. Booker, 543 U.S. 220 (2005), the Court held that sentencing guidelines as constituted violated the Sixth Amendment right to trial by jury. It also held in the second opinion that the sentencing guidelines should be treated and used as discretionary or strictly for advisory purposes. This decision goes to restore to judges the power to use their discretion in passing a sentence on a given case and saving the system from been purely mechanistic.[35]

Other jurisdictions are seeking the use of computer systems to provide decision support for judges or a combination of decision support systems and sentencing guidelines. Sentencing decision support systems as implemented in some of these jurisdictions (see below) are not introduced with the purpose of replacing judges but rather as a mere support to judges to help them more efficiently perform their duties. A judge is still left with the right to heed to the recommendations of the computer systems in part or in full or even discard it entirely. There is room for judges to use their own discretion (been able to choose from a list of correct answers only this time the correct choices are backed with substantial analytic reasoning and evidence provided by the computer).

---

[32] David Bainbridge**,** ''CASE': Computer Assisted Sentencing in Magistrates' Courts' (2005) 5th BILETA Conference

[33] Andrew Von Hirsch, 'Sentencing guidelines and penal aims in Minnesota' (1994) Criminal Justice Ethics vol. 13, 1994

[34] United States Sentencing Commission, 'Federal Sentencing Guidelines Manuals' (2008) <http://www.ussc.gov/2008guid/GL2008.pdf > accessed 3 June 2009

[35] Lisa M. Seghetti and Alison M. Smith, 'CRS Report for Congress, Federal Sentencing Guidelines: Background, Legal Analysis, and Policy Options' Updated June 30, 2007 <http://www.fas.org/sgp/crs/misc/RL32766.pdf> accessed 3 June 2009

However, such systems will to a very good extent reduce the disparity in the sentencing decisions as it will provide in clearer terms to a judge how a decision is arrived at based on statues and past cases of similar nature.

Sentencing decision support system or sentencing information system (SIS) as it may be referred to in some parts of this paper have been around for over two decades. Its level of development and adoption varies from one jurisdiction to another. Some of the countries that have embraced it include Canada, Scotland, Israel, England and Wales, Netherlands, and Australia. Amongst these jurisdictions Canada was the first reported to have experimented with SIS. She however, recorded very limited success (Doob and Part, 1987).[36] The same is not particularly the story in other jurisdictions, as the few jurisdictions that have tried out SIS have recorded varying level of success in terms of the design of the system and its subsequent application.

ENGLAND AND WALES
Computer Assisted Sentencing (CASE) was built for sentencing in Magistrate's Court in England and Wales due to the diversity of the cases that are brought before the court. Magistrates are lay persons with little or no legal background and it is the first court majority of offenders are brought to.[37] The court in passing a judgement on a particular case may be faced with a variety of correct answers. The court is bound to choose from these right answers but not arbitrarily, there must be a strong basis for reaching a particular decision or picking a given choice. This is a huge challenge as the court will have to take into consideration the uniqueness of each case and apply the most appropriate principles.[38] This necessitated the development of CASE to assist magistrates and help make their work easier.
The system was built using Microsoft BASIC after unsuccessful attempts to use existing shells, such as Micro Expert and CRYSTAL II. Shells can be quick and effective for developing sentencing system and indeed any software system. They however, have the disadvantage of constraining the development of the system to the shell's framework or existing structure. The proposed bail decision support system design which will be discussed later will not be built using any existing shells due mainly to the disadvantage pointed out above.

ISRAEL
HaCohen-Kerner & Schild (2001) built an SIS called the Judge's Apprentice. It is a case-based system and provides support to judges in the sentencing of rape and robbery crimes. The system is like a tree with each leave on the tree representing an index. There are 371 leaves or legal concept, each relevant to specific criminal sentencing. These indexes are used for establishing index similarity between the case at hand and previous cases within the sentencing tree. The system retrieves similar cases and also helps in the selection of the most suitable case among the bunch. After which a case-based quantitative assessment is done and used as a basis for arriving at a verdict for the case at hand.[39] In building a BDSS a good starting point will be to begin by limiting the use of the support system to some selected crimes as a pilot. And then monitor the progression and performance of adopting such a scheme and then gradually move it to other forms of crime having tested and debugged the system. The support system can even be modelled to use an index tree similar to the design of the Judge's Apprentice.

NETHERLAND
This system is designed for the northern part of the Dutch Judicial System, it is called NOSTRA. It is limited in scope to offences with not too complex sentencing decisions. Its architecture is such that more features can be added to it with time- that means it has an open architecture. It provides judges with the ability to compare present cases with previous cases, see the decision in the previous cases and see the argument preceding the decision. The actual programming language used in developing NOSTRA was not clearly stated

---

[36] A.N Doob and N.W Park, 'Computerised Sentencing Information for Judges' (1987) Criminal Law Quarterly 30: 54–72

[37] David Bainbridge, ''CASE': Computer Assisted Sentencing in Magistrates' Courts' (2005) 5th BILETA Conference

[38] These intricacies and the careful and rightful application of the law is seen in the judgement of Dunn L.J. in De Havilland(1983) 5 Cr. App. R. (5) 109 and the judgment of Lord Lane C.J. in Barrick (1985) 7 Cr. App. R. (5) 142

[39] Y. Hacohen-Kerner and U.J. Schild, 'Case-based Sentencing Using a Tree of Legal Concepts', (2001) Information & Communications Technology Law, Volume 10, Issue 1 March 2001 , pages 125 - 135

by Jenne et al (1998). Although it was stated that it was built on open platform and it is a case-based decision support system.[40] One key lesson from this system which is applicable to the proposed BDSS is its open architecture. The proposed BDSS will be built on an open architecture thus having the provision for future features to be added to the system as the need arise and able to readily interconnect to other systems.

NEW SOUTH WALES, AUSTRALIA

The New South Wales SIS was developed primarily not to curtail discretionary judgement by judges but rather to provide more and accurate information upon which a judge can make a more informed discretionary judgment. And of course like other SIS it aims to also promote consistency, rationality and at the same time assisting judges to adhere to the tenets of the law.[41] This SIS is built using web (HTML) technology, meaning it can be accessed using regular web browsers such as Netscape and internet explorer. The application subsystem is built on Windows NT, MS IIS Server, Netscape Communication Server, ISYS.web Search engine, Topic Search Engine and MS Office Professional. The SIS can be extended to include more features because its architecture is open allowing for easy expansion. It can seamlessly be interfaced with other systems that can generate ASCII or other standard word processing output. And importantly it can be connected to other existing databases through Open database Connectivity (ODBC).[42] This is important because it may become necessary for the SIS to be linked to other databases that may hold vital information on citizens from which a judge can obtain certain vital information on offenders. The proposed bail DSS will be built using web technology such that it can be accessed over the web from a remote location using regular web browsers such as internet explorer, Mozilla Firefox, Netscape and chrome. And its database structure and design will be such that it can easily be connected to other databases.

SCOTLAND

The Scottish SIS basically took its lead from that of New South Wales, Australia. It all began after Lord Justice Clerk got an inspiration from the demonstration of the New South Wales System in a conference of the Commonwealth of Learning held in Canada.[43] Work started in earnest on the Scottish SIS in 1993 in the University of Strathclyde. But the system did not go into full use in the High Court until February 2002.[44]

The SIS comprises of two main subsystems. The first subsystem is the interface that allows for data to be entered into the system thereby updating the databases. With this judges and clerks can enter new cases into the system. It also allows judges to enter information detailing the reasons behind the decision they took on a particular case. The second subsystem is for data retrieval. The system allows judges to readily retrieve data on a previous case entered into the database. The system more or less has the same set of features as is the case with the New South Wales SIS. The proposed bail DSS will have high security and allow different levels of access, while some may have read only access some may go as far as having both read and write access. People with write access such as clerks and judges will be able to update the database from time to time. However, when the database is updated before the new addition is finally accepted it will go through a set level of approval. This is to create checks and balances so that the systems is not abused and wrong data entered or deleted without following due process.

---

[40] Jenne Van Der Vinne, Ing. W Van Zwol and M Karnekamp 'A Sentencing Information System Named 'NOSTRA'' (1998) IJL&IT 1998 6 (230)

[41] Austin Lovegrove, 'Statistical Information--Systems as a Means to Consistency and Rationality in Sentencing' (1999) IJL&IT 1999 7 (31)

[42] Ibid

[43] Cyrus Tata, John N. Wilson and Neil Hutton, 'Representations of Knowledge and Discretionary Decision-Making by Decision-Support Systems: the Case of Judicial Sentencing' (1996) JILT 1996 (2) <http://www2.warwick.ac.uk/fac/soc/law/elj/jilt/1996_2/tata/#a3.2.4.1> accessed 2 June 2009

[44] The Sentencing Commission for Scotland, 'The Scope to Improve Consistency in Sentencing' Report – 2006 <http://www.scottishsentencingcommission.gov.uk/docs/consistency/Consistency%20Report%20-%20Final.pdf> accessed 30 May 2009

The proposed BDSS will be built taking into consideration all the above mentioned lessons from existing sentencing decision support systems and indeed the work by Patricia Hasset on BDSS.

IV. BAIL DECISION SUPPORT SYSTEM

Hassett's work, although a prototype, is quite insufficient and limited in scope to solve the challenges of the bail system. A system that checks if an offender will answer bail when released is not robust enough to solve the present shortcomings of the bail system or provide substantial help to judges in making bail decisions. A defendant should not be denied bail only on the basis that he may not answer bail nor should he be granted bail only on the premise that there is substantial evidence that he will not flee. It is not that this is not a good ground to deny a suspect bail but it should not be the only ground for which a defendant is denied bail. Schedule 1 to the Bail Act 1976 provides other conditions under which an accused may be denied bail. Some of these include if there is a strong proof that the accused may commit an offence while on bail, interfere with witnesses or otherwise obstruct the course of justice, whether in relation to himself or any other person and if the court is satisfied that the defendant should be kept in custody for his own protection or, if he is a child or young person, for his own welfare.

If there is strong suspicion that an accused will fail to surrender to custody if granted bail, he may be granted bail with strong conditions. His travel passport may be ceased. He may be asked not to move outside a particular locality. His movement may be monitored by responsible law enforcement body. So if the defendant can be prevented from not reporting to the court why deny him bail simply because there is some doubt that he may not return for trail.

However, if there is some other supporting evidence against the accused such as one or more of the exceptions under Schedule 1 to the Bail Act 1976 the accused may be refused bail. Take a scenario where an accused is granted bail on the fact that he will definitely return to the court on the appointed date but failing to recognise that the accused may go ahead to commit further crime when on bail as was the case with Garry Weddel see above. Likewise the fact that a defendant has past criminal record does not mean that if released he will go back to commit further crime. The weight of the crime or the severity of the likely sentence against the defendant if found guilty is not sufficient to conclude that the defendant will abscond if granted bail. In other words other factors have to be taken into consideration when making a bail decision.

To ensure that judges render the right bail sentence taking into consideration the provisions of the bail Act, there is need to seek the help of intelligent computer systems, a system that will focus on the court not denying or granting a defendant bail unjustly. This system is a decision support system tailored to the bail domain. A BDSS is, therefore, computer software designed to assist judges and police-officers make the right bail decisions. Decision support systems are expert systems if they do not stop at presenting raw data to the user. If the system goes the extra mile of analysing the data and providing the user with suggestions as to how it arrived at a conclusion then it is an expert system as it possesses some intelligence. Take an example of a judge who was presented with the case of a suspected criminal who apparently is seeking bail until the next hearing of his case in court. Obviously the judge will want to look up the suspect's past criminal record, consider the circumstances surrounding this very crime, check if the suspect has been granted bail for any previous offense and whether he kept to the bail conditions. He may also want to refer to the outcome of previous cases of similar nature and circumstance if available. When the judge keys in the personal details of the suspect the system should be able to immediately query its database and provide the judge with the suspect's past criminal records. It should also provide the judge with other details such as the marital status, employment status and age of the suspect. The system will then use these two sets of details to provide recommendation as to whether the suspect should be granted or denied bail and the possible bail terms and conditions. The system should also be able to provide reason for its recommendations, thus doing the hard work for the judge. The judge does not have to take the recommendations of the BDSS verbatim but it can be a very solid guide to the bail decision to be made by the judge. This system should be able to seamlessly connect to other existing relevant databases and extract information based on the judge's query that are relevant to specific cases.

4.1 Risk Assessment: Reasons for Developing a BDSS

The decision maker has to ascertain if there is 'substantial grounds' to believe that the accused will not reoffend, flee or obstruct justice if released. If 'substantial grounds' does not exist for the decision marker to believe that the accused will reoffend, flee or obstruct justice if released, the statues provide the accused is to be released and asked to return to court at a particular date for hearing of the case. If 'substantial grounds' does, however, exist for the decision maker to believe that upon release the accused may flee, obstruct the

administration of justice or re-offend, the statues provide that the accused should be detained or released with conditions. The bail decision maker has to carefully analyse the risk of releasing or detaining an accused.

Experienced magistrates may be able to use their wealth of experiential knowledge to determine if an accused will flee or reoffend if granted bail based on certain considerations but the chances of the magistrate getting it wrong is very high. However, this can be more efficiently achieved using data mining tool that correlates records in the criminal justice system with personal sociological features. In addition statistical analysis can be carried out on the behaviour of previous cases of bail granted or denied. The analysis will help determine how many persons granted bail fled or re-offended within a given time period. It will show what kind of crime has the highest and least number of re-offenders, accused that fled and those that tampered or attempted to obstruct the administration of justice. It will show how many of these people are female or male, their ages and other vital details. This sort of statistical tool will be an integral part of a robust BDSS such as the one proposed in this paper.

Yet another form of risk worth giving full attention is the risk of wrongfully denying bail or granting bail. As mentioned earlier it is improper and very unfair to an accused if he is wrongfully denied bail. This may cause the accused to suffer various devastations such as relationship with family, loss of employment, health issues and physiological trauma. And on the other hand, as also earlier pointed out granting bail wrongfully can affect the confidence the public has on the judicial system. The person released on bail can go back and commit further crime (see the case of Garry Weddel above) or flee. It is therefore, very important that in-depth risk analysis be carried out before granting bail or denying an accused bail. This sort of analysis cannot be carried out immediately by the decision maker within the very limited time frame which he has to make a bail decision without needing the help of a well designed and tailored software tool. The BDSS proposed in this paper will be able to carry out this risk analysis and present the decision maker with results and reasons behind each result. This still allows the decision maker room to use his discretion to choose the most appropriate answer but this time he sees the reasoning behind each result, he does not have to choose a result and corresponding reason but may modify the result and/or the reasoning behind the result to more suitably address the case at hand.

Finally, it may be wrong for similar crimes committed under very similar circumstances to attract bail decisions that are very wide apart. The bail process as presently structured does not have what it takes to fix this challenge. It will take a system that has a database of previous crimes and their corresponding bail decision to solve this problem.

4.1.1 Risk of Reoffending

A study titled 'Re-offending on Bail in Avon and Somerset' (Bristol: Avon and Somerset Constabulary, 1991) revealed some interesting results on factors that could influence the likelihood of an accused reoffending while on bail. It showed that 28 percent of accused granted bail reoffends from a court summary, CID survey showed the proportion to be 27% while the questionnaire result from Custody Officer showed the portion to be 12 percent. According to the study the major factors associated with reoffending include;

- Age of defendant: younger defendants (those aged between 17 and 20 years) are twice more likely to reoffend than those aged 26 years and above,
- Type of offence: suspects on bail for vehicle-related crime and burglary showed high likelihood to reoffend, and
- Number of previous convictions has also shown to be a major contributor to the likelihood of reoffending.

A more recent study than the one above, 'Offending on Bail and Police use of Conditional Bail' (Brown, D., Home Office Research and Statistics Directorate, Research findings No. 72, London: Home Office, 1998, p.1) gave revelations that were not too far from the previous study. It showed that suspects granted bail for vehicle-related crime have the highest tendency of re-offending (44 percent) followed closely by suspects on bail for crime of theft by shoplifting (40 percent). It also revealed that younger people (juvenile) are twice as likely to reoffend compared to their adult counterparts. Another study 'Remand Decisions and Offending on bail: Evaluation of the bail Process Project' (Morgan, P., and Henderson, P., Home Office, 1998, p.45) revealed that the following factors are also responsible for re-offending: persons with no fixed home address (42 percent), suspects who had to wait for more than six months before trial or sentence (32 percent), suspects charged with car theft (32 percent), suspects who has previously breached bail (27 percent), those who have previously been jailed (28 percent), suspects below 18 years of age (29 percent) and unemployed suspects (21 percent). This study also went further to show that suspects with shorter period to trial disposition (that is waited for less than say one month) were less likely to reoffend (4 percent). Also only 7 percent of employed suspects will reoffend

and only 6 percent, 7 percent and 8 percent respectively for sex offences, assault and fraud. From the foregoing the risk of reoffending can be summarised as shown below:

High: Suspect is below 18 years of age; Suspect has no fixed address; Offence is vehicle-related or burglary; Suspect is not employed; Suspect has previously breached bail; Suspect has gone to jail before for a crime; Suspect has to wait for more than six months for case to be heard.

Low: Suspect is adult, above 18 years of age; Suspect has a fixed home address; Suspect has to wait for a short period before trial; The offence is sex related, assault or fraud.

4.1.2 Risk of non-appearance

Ensuring that a suspect will attend his trial as at when due is very important in the granting of bail. This was affirmed by Lord Russell in R v Rose (1898) 78 LT 119. According to a research carried out by New York City Criminal Agency some factors should be taken into consideration when assessing risk of flight. These factors include; family ties, probable sentence (strength of offence), past criminal record, employment status, how long suspect has lived in the community, character and mental stability of suspect and whether or not suspect has failed to surrender to bail in the past.

Patricia Hassett (1992)[45] pointed out that risk of flight is influenced by whether the penalty upon conviction is custodial or not and also by the level of family and community ties. A man who has a wife, with children who are in school, has a mortgage of which he has paid substantial equity and has a good and stable job is less likely to abscond. He will not want to lose all the above mentioned simply because he wants to avoid a short period of incarceration.

A study showed that 7 percent of defendants granted police bail failed to attend first court appearance as at when due and 9 percent of those granted court bail failed to attend at least one court hearing. (Brown, D., 'Offending on Bail and Police use of Conditional Bail'(1998) Home Office Research and Statistics Directorate, Research findings No. 72, London: Home Office, 1998, p.1). Neil Corre and David Wolchover (2004)[46] pointed out that factors which have likely influence on whether a subject will abscond include; nature and seriousness of offence, the character of the defendant (has he been convicted of previous offences if so how many times, see R v Vallet [1951] 1 All ER 231), the kind of people he associates with, community ties, previous bail history, character, the defendants mental stability, family ties, probable sentence (strength of offence), past criminal record and employment status. From the foregoing the risk of non-appearance can be summarised as shown below:

High: No strong family ties, perhaps say not married or have any kids; Does not have a fixed address or any form of ties to the community; Has previously breached bail; Has previously been convicted on a related offence; Penalty if convicted is custodial; Has no job; Is linked with a criminal group; Is not mentally stable.

Low: Strong family ties; Employed; Strong community ties; Never breached bail in the past; Penalty if convicted is not custodial; No past criminal record; Mentally stable and of good character

4.1.3 Risk of interfering with the administration of justice

The risk of obstruction to the proper administration of justice is one that must be well assessed in determining whether a defendant should be granted bail. Witnesses must not be intimidated or coerced in any way and evidence must not be tampered with by the defendant. Factors that should be considered in measuring the risk of interference by a defendant include;

- The relationship between the defendant and the witness. If the defendant is very close to the witness, say they live in the same house, chances are that the defendant may interfere with administration of justice,
- In a situation where there is close proximity between the defendant's house and the witness or if the defendant has easy access to the witness. He can easily go and intimidate the witness or persuade him through other means not to testify,
- The defendant can easily access the evidence. Take a scenario the defendant is accused of stealing a car or killing a little boy and in both cases the stolen car or the dead boy is not yet traced. Chances are that if released he may go ahead to ensure that the car is not found or the dead boy's body is not discovered,

---

[45] Patricia Hassett,, 'A Prototype Expert System For Making Bail Recommendations', (1992) 7th BILETA Conference, Information Technology and Legal Education: Towards 2000, 9th & 10th April 1992

[46] Neil Corre and David Wolchover, *Bail in Criminal Proceedings*, (3rd Edition, Oxford University Press, 2004) Chapter 1: Right to bail

•   If there is believe that the defendant may have access to jurors and may bribe them or intimidate them, the defendant is part of larger group and other suspects are still at large. If released on bail he may tip-off other suspects.

•   The defendant has directly threatened the witness or has somehow (be it directly or indirectly) admitted to do so.

From the foregoing the risk of interfering with the administration of justice can be summarised as show below:

    High: Accused and witness live in the same house; Accused lives very near to witness; Accused can easily access evidence if released; There is a strong likelihood that the accused may bribe or intimidate the jurors if released; The accused has threatened the witness

    Low: Accused is not related to witness; Accused has no access to witness; Accused if released will have no access to evidence; There is no chance that the accused will intimidate or bribe the jurors; Accused has in no way threatened the witness

4.2   Design of A BDSS

    In building the BDSS an interface would be developed for entering new bail cases; the outcome and the reasoning behind the bail decision. A list of possible outcomes would be built into the system based on the analysis under the risk assessment section, see above. Also a list of reasoning behind the outcome will also be built into the system. Then there will be fields for the decision maker to enter additional comments under the case outcome field and the reasoning field. For the system to be effective and efficient there must be a large number of previous cases, outcomes and reasoning behind the outcome entered into the database of the system. This system will be implemented using web based technology such as ColdFusion or PHP to allow for centralized access by all judges. The system would also be flexible enough to connect to third party databases for references.

    The system is modelled using the three risk analysis scenarios detailed above. Figure 1 below shows the process flow diagram for the risk of reoffending. Each of the risk variables is assigned specific weight as would have been determined by the judicial system, meaning it is basically a hybrid of case-based and rule-based reasoning structure. The system computes the cumulative weight by multiplying the weight of the variable by 1 if it is a yes or by 0 if it is a No. The same thing is repeated in figure 2 for the risk of non-appearance and figure 3 for the risk of interfering with the administration of justice. The points obtained in each of these three sections are further added together and weighed against set thresholds, see figure 4. If the point gained is above a given threshold the result will be bail denied, if it is however below the threshold it is bail granted. The bail granted could be conditional or unconditional depending on how much the point is below the set threshold, see the scenario under artificial neural networks.
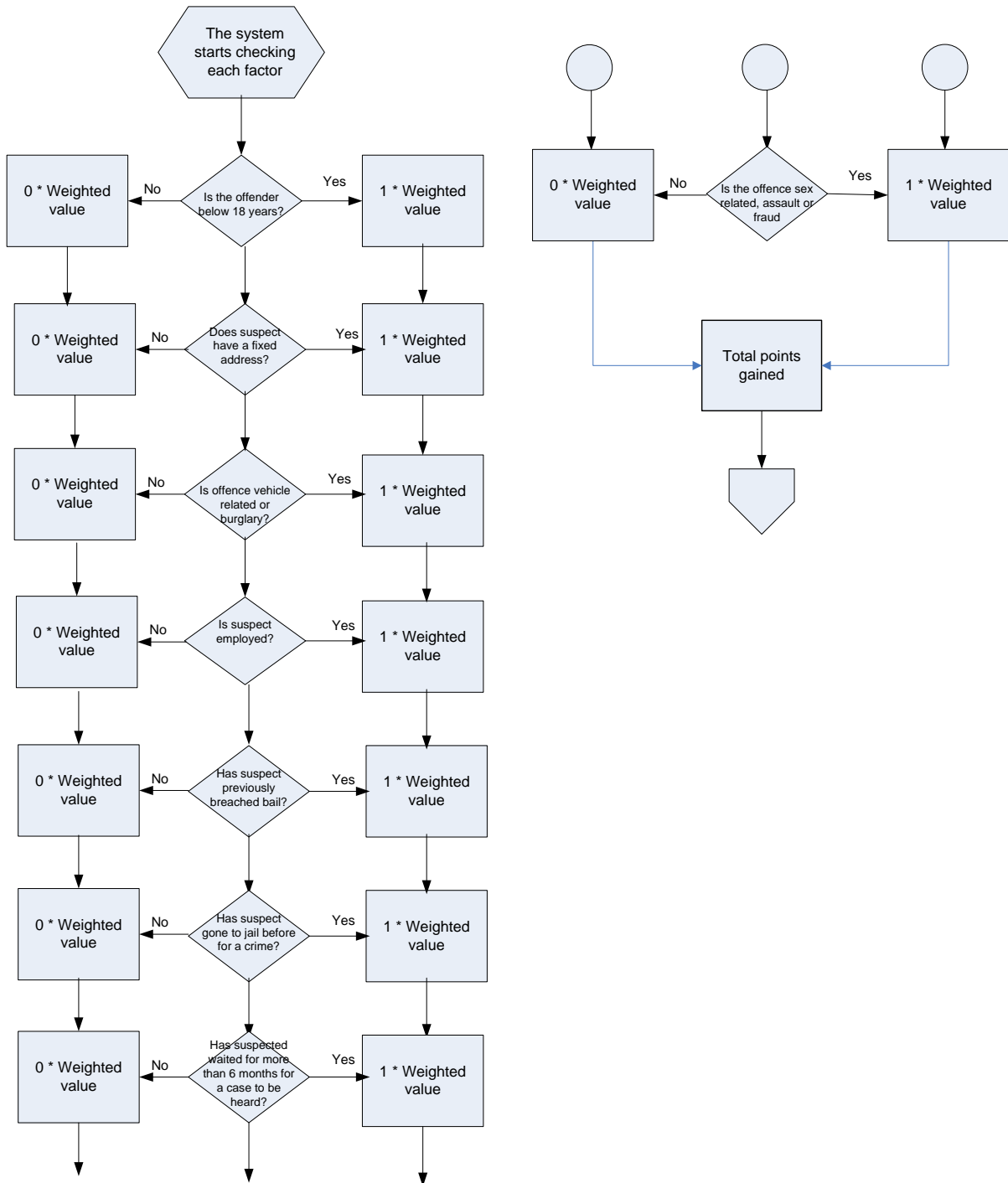
Figure 1

Risk of non-appearance – Each risk factor is assigned a value of 1 if answer is YES and 0 if answer is NO. Each risk factor has a weight which would be aggregated at the end of this process.

The system starts checking each factor

0 * Weighted value	No ← Does the suspect have strong family ties? → Yes	1 * Weighted value
0 * Weighted value	No ← Is the suspect gainfully employed? → Yes	1 * Weighted value
0 * Weighted value	No ← Has the suspect lived in the community for a long time and has good ties to the community? → Yes	1 * Weighted value
0 * Weighted value	No ← Has suspect ever breached jail in the past? → Yes	1 * Weighted value
0 * Weighted value	No ← Is penalty if convicted not custodial? → Yes	1 * Weighted value
0 * Weighted value	No ← Does suspect have a past criminal record → Yes	1 * Weighted value
0 * Weighted value	No ← Is suspect mentally stable and of good character? → Yes	1 * Weighted value

Total points gained

Figure 2

Risk of interfering with administration of justice – Each risk factor is assigned a value of 1 if answer is YES and 0 if answer is NO. Each risk factor has a weight which would be aggregated at the end of this process.
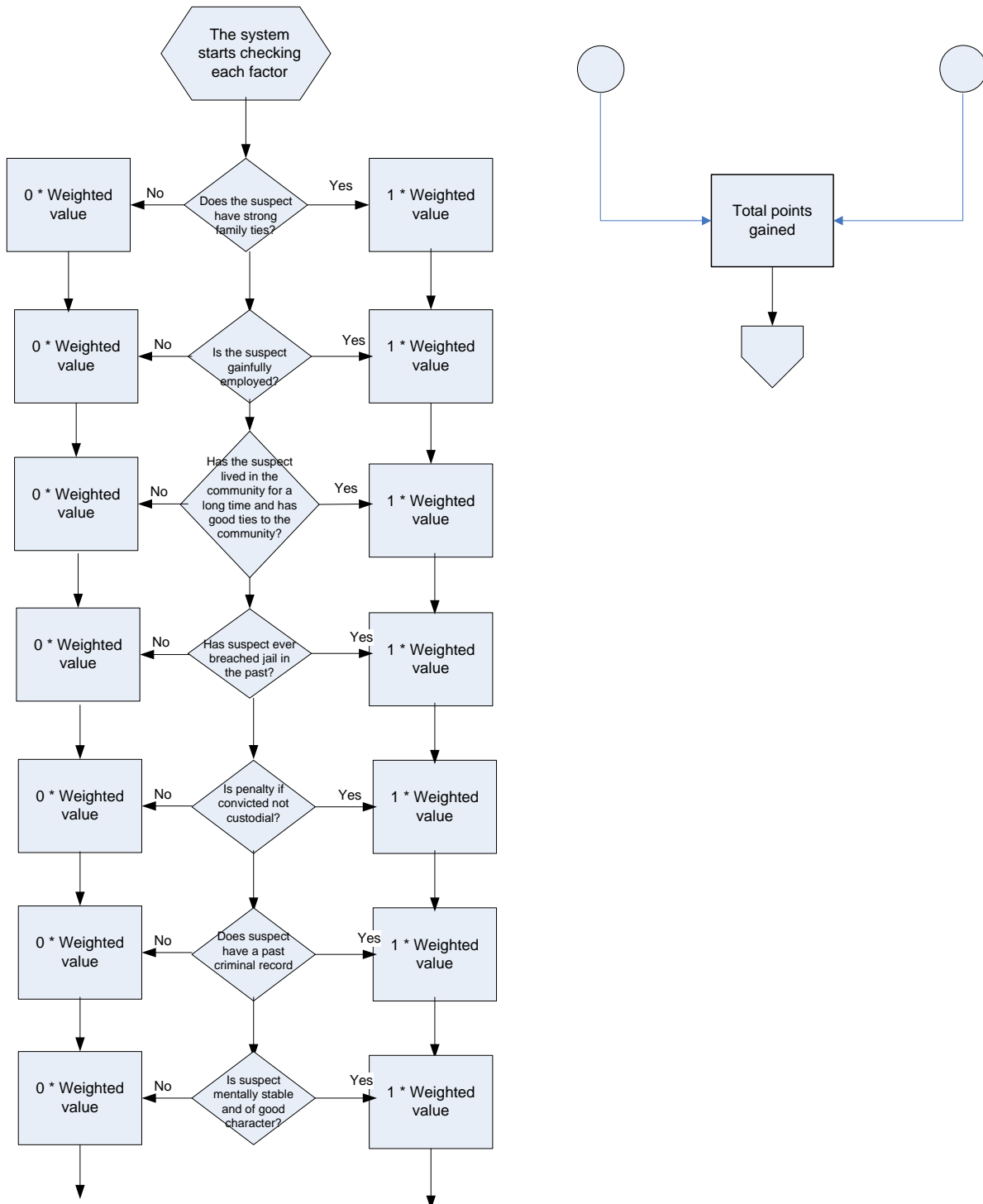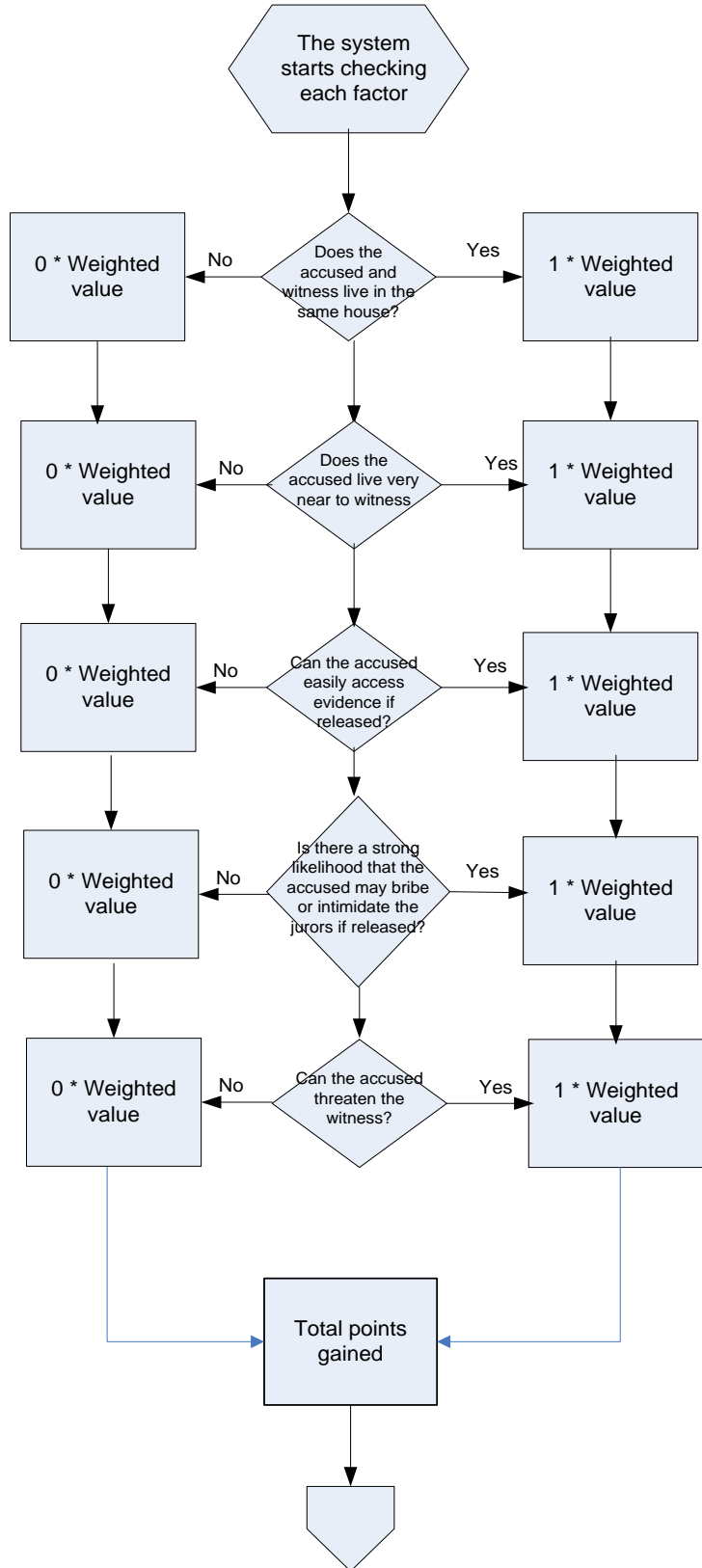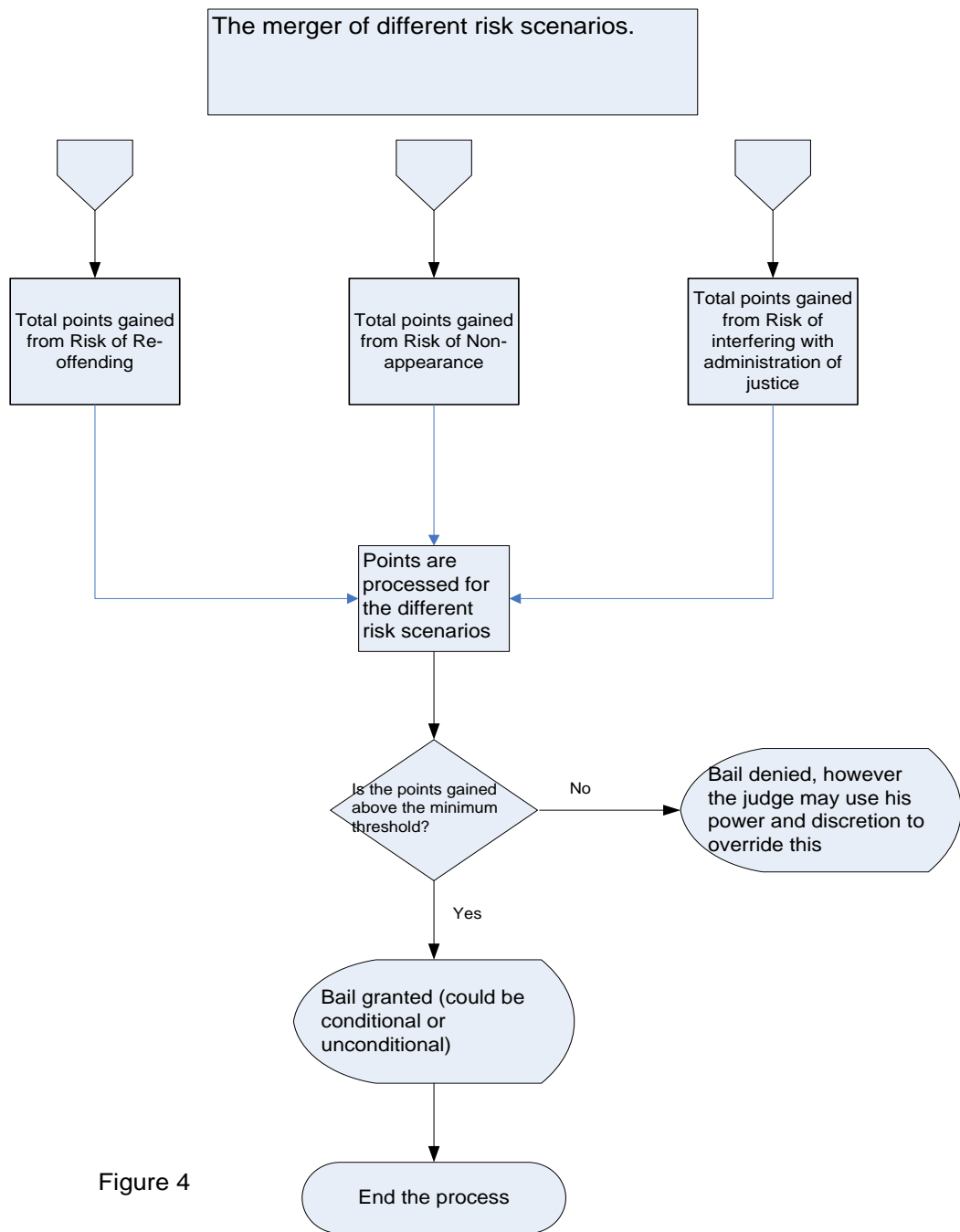
```
                    ┌──────────────┐
                    │  The system  │
                    │ starts checking│
                    │  each factor │
                    └──────┬───────┘
                           │
                           ▼
┌──────────────┐   No   ╱◇╲   Yes   ┌──────────────┐
│ 0 * Weighted │◄──── Does the ────►│ 1 * Weighted │
│    value     │      accused and    │    value     │
└──────┬───────┘   witness live in   └──────┬───────┘
       │           the same house?          │
       ▼                 │                   ▼
┌──────────────┐   No     ▼       Yes ┌──────────────┐
│ 0 * Weighted │◄──── Does the ──────►│ 1 * Weighted │
│    value     │      accused live    │    value     │
└──────┬───────┘      very near to    └──────┬───────┘
       │               witness                │
       ▼                 │                     ▼
┌──────────────┐   No     ▼       Yes ┌──────────────┐
│ 0 * Weighted │◄──── Can the ───────►│ 1 * Weighted │
│    value     │      accused easily   │    value     │
└──────┬───────┘      access evidence  └──────┬───────┘
       │              if released?             │
       ▼                 │                     ▼
┌──────────────┐   No     ▼       Yes ┌──────────────┐
│ 0 * Weighted │◄──── Is there a ────►│ 1 * Weighted │
│    value     │      strong          │    value     │
└──────┬───────┘      likelihood that  └──────┬───────┘
       │              the accused may          │
       │              bribe or intimidate      │
       ▼              the jurors if released?   ▼
┌──────────────┐   No     ▼       Yes ┌──────────────┐
│ 0 * Weighted │◄──── Can the ───────►│ 1 * Weighted │
│    value     │      accused threaten │    value     │
└──────┬───────┘      the witness?      └──────┬───────┘
       │                                        │
       └──────────►┌──────────────┐◄───────────┘
                   │ Total points │
                   │   gained     │
                   └──────┬───────┘
                          │
                          ▼
                       ⬡
```

Figure 3

The merger of different risk scenarios.

Total points gained from Risk of Re-offending

Total points gained from Risk of Non-appearance

Total points gained from Risk of interfering with administration of justice

Points are processed for the different risk scenarios

Is the points gained above the minimum threshold?

No → Bail denied, however the judge may use his power and discretion to override this

Yes

Bail granted (could be conditional or unconditional)

Figure 4

End the process

Neural technology will later be incorporated into this system when the database has grown large enough to adequately train the neural network, giving rise to a system similar to what is obtained in 'split-up'[47]. Artificial Neural Networks (ANNs) are computer programmes designed to function the same way as the human brain. They are made up of artificial neurons called neurods which are connected to each other by 'links'. These 'links' have varying weights. When designing a system, the combined weight of all the input neurods is compared or measured against a pre-determined threshold[48].

ANNs have the advantage of being able to extract patterns and detect trends, as in link analysis, between two or more related or disparate activities. These patterns and trends ordinarily may not be easily noticeable by human or other computer systems. For instance ANN can be used to detect if there is a link between a suspect and previous suspects or convicted criminals. Such revelations may be invaluable in reaching a bail decision by a judge. ANN can also carry out complex computational analysis in real-time and in parallel with other computational analysis.
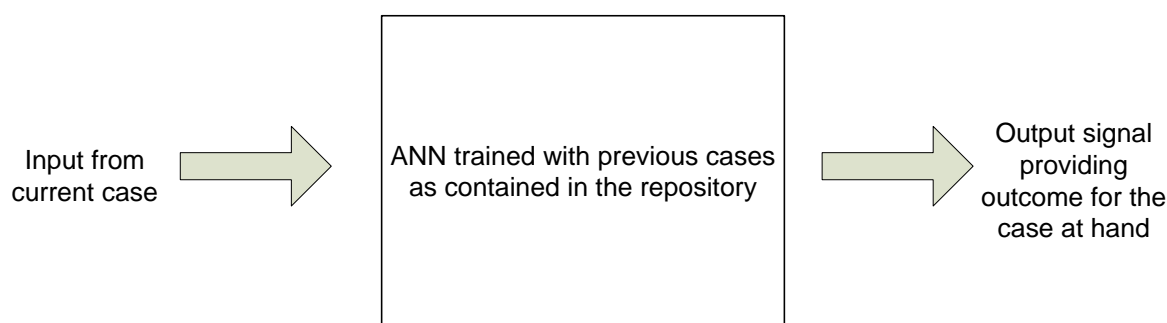

Figure 1

ANN compares the input signals provided from the current case with the existing cases stored in the repository. ANN is able to determine the nature of the crime and predict with substantial level of intelligence, based on the training it has received, the outcome of the case, see figure 1 above. This is achieved by identifying the correlation (similarity and pattern) between the current case and existing cases in the database. It matches the case with the existing cases and filters out the cases that most closely match the current case. Based on the outcome of the previous cases it can then go ahead to predict the outcome of the current case[49]. Ordinarily ANNs do not provide explanation as to how it arrived at a given conclusion.

Let us model a scenario involving a 16 year old unemployed boy who is involved in a vehicle-related crime. This suspect has previously breached bail and has no fixed address.

---

[47] J Zeleznikow and A Stranieri, 'Split up: an intelligent decision support system which provides advice upon property division following divorce'(1998) IJLIT 6(2):190-213; Oxford University Press

[48] Dan Hunter, 'Commercialising Legal Neural Networks' (7 May 1996) JILT 1996 (2) <http://www2.warwick.ac.uk/fac/soc/law/elj/jilt/1996_2/hunter/> accessed 28 June 2009

[49] Marco Costa, Orlando Sousa and José Neves, 'An Architecture to Legal Distributed Case Repositories', *JURIX 1998* <http://www.jurix.nl/pdf/j98-02.pdf> accessed June 26 2009
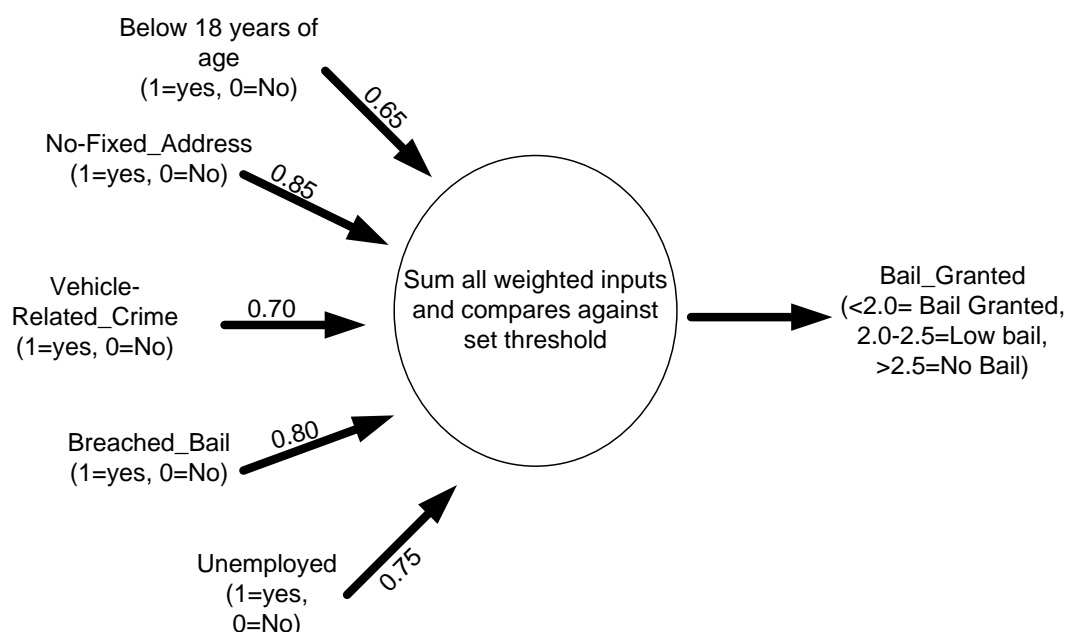
Figure 2

From the case above which is graphically represented in figure 2 above the system can predict the possible outcome of the case by adding up the input and comparing it against the set threshold. (1x0.65) + (1x 0.85) + (1x0.70) + (1x0.80) + (1x0.75) = 3.75 This outcome compared to the set threshold will suggest that no bail should be granted to the suspect. However, if there is some changes to the status of the suspect the outcome may be significantly different. If the status of the suspect where to be different, say the offender has a fixed address and is gainfully employed it could change the output. In such a scenario the resulting outcome will be: (1x0.65) + (0x 0.85) + (1x0.70) + (1x0.80) + (0x0.75) = 2.15 This means that low bail or conditional bail may be granted to the suspect based on the set threshold.

V.   CONCLUSION

Decision support system can be used to improve the efficiency of the bail system. This system can provide substantial support to the decision making process, providing the decision maker with accurate information in the right format. It can process huge and complex information within a very short period, saving time and freeing the decision maker to focus on more delicate issues pertaining to bail such as analysing the system's final output and reaching final conclusion.

Decision support system is only as effective as those who conceived and designed it. To be able to build a robust system, good time has to be spent on brainstorming and planning. And those who interpret the outputs from the system should be very knowledgeable and should be able to provide sound feedback for immediate use and for future upgrade or redesign of the system. It is recommended that legal professionals be part of the design and implementation of the bail decision system.

Finally, the decision support system as proposed in this paper should be built on open architecture, should be easily upgradeable, should have a simple interface, built on web technology and easy to use. As the number of bail cases in the repository grows, neural network technology may then be introduced. These previous cases will be used to train and retrain the neural network until it is able to take intelligent decision on its own with minimal or no support from a user. However, the decision reached by the system is subject to interpretation by the user (in this case the judge). The judge too will require training on how to use the system.

BIBLIOGRAPHY

[1]   A.N Doob and N.W Park, 'Computerised Sentencing Information for Judges' (1987) Criminal Law Quarterly 30: 54–72.
[2]   Adrian Turner, 'Getting It Right From The Start', Justice of the Peace, 10 August 2002.
[3]   Alan Travis, 'Overcrowding blamed for rise in prison deaths' The Guardian (London Saturday 22 September 2007)
       <http://www.guardian.co.uk/uk/2007/sep/22/ukcrime.prisonsandprobation> accessed 20 May 2009

[4]   Albert Alschuler, 'Preventive Pre-trial Detention and the Failure of Interest-Balancing Approaches to Due Process,' (1986) 85 Michigan Law Review 510.

[5]   Andrew Von Hirsch, 'Sentencing guidelines and penal aims in Minnesota' (1994) Criminal Justice Ethics vol. 13, 1994

[6]   Andrew Vincent and John Zeleznikow, 'Towards a plea bargaining decision support system for Legal Aid lawyers in Victorian lower courts', John Zeleznikow, Arno R. Lodder, *Second international ODR Workshop*, Tilburg: Wolf Legal Publishers, pp 47-,58 2005 <http://odrworkshop.info/papers2005/odrworkshop2005VincentZeleznikow.pdf> accessed 27 May 2009

[7]   Andrew Greinke, 'Legal Expert Systems - A Humanistic Critique of Mechanical Legal Inference' (1994) MUEJL Volume 1, Number 4 <http://www.murdoch.edu.au/elaw/issues/v1n4/greinke14.html> accessed 29 March 2009

[8]   Arno R. Lodder, Anja Oskamp and Marius J.A. Duker, 'AI & Criminal Law: Past, Present & Future' *JURIX 1998* <http://www.jurix.nl/pdf/j98-05.pdf> accessed 30 May 2009

[9]   Austin Lovegrove, 'Statistical Information--Systems as a Means to Consistency and Rationality in Sentencing' (1999) IJL&IT 1999 7 (31)

[10]   Baroness Scotland, 'Comment: Closing The Justice Gap', Law Society Gazette, 4 December 2003.

[11]   BBC News, 'Prison overcrowding 'at crisis point'' BBC News (London Wednesday, 28 August, 2002) <http://news.bbc.co.uk/2/hi/uk_news/2222022.stm> accessed 20 May 2009

[12]   BBC News 'Murder case bail ban 'problems'' BBC News (London Tuesday, 17 June 2008)

[13]   < http://news.bbc.co.uk/1/hi/uk_politics/7458211.stm> accessed 5 June 2009

[14]   B.E. Leake, *Case-Based Reasoning: Experiences, Lessons, & Future Directions*. (AAAI Press, Cambridge, MA, 1996)

[15]   Chan J. 'A Computerised Sentencing Information System for New South Wales Courts' (1991) Computer Law and Practice, 137–150.

[16]   Christos Stergiou and Dimitrios Siganos, 'Neural Networks' <http://www.doc.ic.ac.uk/~nd/surprise_96/journal/vol4/cs11/report.html> accessed 29 May 2009

[17]   Criminal Justice System, 'Upholding the Rights of the Defendants' <http://www.cjsonline.gov.uk/defendant/bail/> accessed 18 April 2009

[18]   Cyrus Tata, John N. Wilson and Neil Hutton, 'Representations of Knowledge and Discretionary Decision-Making by Decision-Support Systems: The Case of Judicial Sentencing' (1996) JILT 1996 (2) <http://www2.warwick.ac.uk/fac/soc/law/elj/jilt/1996_2/tata> accessed 4 June 2009

[19]   D. Brown, 'Offending on Bail and Police use of Conditional Bail'(1998) Home Office Research and Statistics Directorate, Research findings No. 72, London: Home Office, 1998, p.1

[20]   Dan Hunter, 'Commercialising Legal Neural Networks' (7 May 1996) JILT 1996 (2) <http://www2.warwick.ac.uk/fac/soc/law/elj/jilt/1996_2/hunter/> accessed 28 June 2009

[21]   Daniel C. Richman 'The Story of United States v. Salerno: The Constitutionality' (2005). <http://lsr.nellco.org/cgi/viewcontent.cgi?article=1011&context=fordham/flfc> accessed 17 May 2009

[22]   David Bainbridge, ''CASE': Computer Assisted Sentencing in Magistrates' Courts' (2005) 5th BILETA Conference

[23]   Dorset Police Force, 'Bail Conditions' <http://www.dorset.police.uk/default.aspx?page=1024> accessed 16 May 2009

[24]   Emilia Bellucci and John Zeleznikow, 'Developing Negotiation Decision Support Systems that support mediators: a case study of the Family_Winner system' (2006), Journal of Artificial Intelligence and Law, 13(2): 233-271.

[25]   Emilia Bellucci and John Zeleznikow, 'Representations for decision making support in negotiation' (2001) Journal of Decision Support, volume 10(3-4): 449-479.

[26]   Hubert L. Dreyfus and Stuart E. Dreyfus, 'From Socrates to Expert Systems: The Limits and Dangers of Calculative Rationality'. <http://www.psych.utoronto.ca/users/reingold/courses/ai/cache/Socrates.html> accessed 25 March 2009

[27]   Ivan Potas et al, 'Informing the Discretion: The Sentencing Information System of the Judicial Commission of New South Wales', (1998), IJL&IT 1998 6 (99)

[28]   J. Hogarth, Sentencing *as a Human Process* (University of Toronto Press: Toronto 1971).

[29]   J. Hogarth, *Computer and the Law: Sentencing Database System*, User's Guide (Vancouver: LIST Corporation 1988)

[30]   James J. Pomykalsk,i Walter F. Truszkowski and Donald E. Brown, 'Expert Systems' (1999) <http://agents.gsfc.nasa.gov/papers/pdf/es.pdf> accessed 5 April 2009>

[31]   Jean-Charles Pomerol and Patrick Brézillon, 'Context Proceduralization in Decision Making'. <http://www-poleia.lip6.fr/~brezil/Pages2/Publications/26800491JCP.pdf> accessed 2 April 2009

[32]   Jenne Van Der Vinne, Ing. W Van Zwol and M Karnekamp 'A Sentencing Information System Named 'NOSTRA'' (1998) IJL&IT 1998 6 (230)

[33]   John S. Goldkamp and Michael R. Gottfredson, 'Bail decision making and pre-trial detention Surfacing judicial policy' (2005) Springer Netherlands, Law and Human Behaviour

[34]   J Zeleznikow and A Stranieri, 'Split up: an intelligent decision support system which provides advice upon property division following divorce'(1998) IJLIT 6(2):190-213; Oxford University Press

[35]   Joseph A. Cannataci, 'Law, liability and expert systems' (1989) AI & Society Volume 3, Number 3 / July, [1989] 169-183

[36]   Joseph Weizenbaum, *Computer Power and Human Reason: From Judgement to Calculation*, (W. H. Freeman & Co., New York, NY, USA, 1976)

[37]   J.T. St. Johanser and R.M. Harbridge, *Validating Expert systems: Problems and Solutions in Practice* (KBS-86, London, 1986)

[38]   K. White, 'From 'Knowing' to Legal Knowledge: Using Early Twentieth Century Canadian Murder Trials to Problematize Knowledge Management Technology' (2004) CAUT Law Forum - Winnipeg, 2004

[39]   Kenneth Russell, 'Electronic Monitoring' (1987) New Law Journal, 20 March 1987.

[40]   Larry Laudan, *Truth, Error, and Criminal Law: An Essay in Legal Epistemology,* (Cambridge Studies in Philosophy and Law, CUP, Cambridge 2005)

[41]   Laurie L. Levenson , 'Detention, material witnesses & the war on terrorism', (2003) <http://llr.lls.edu/volumes/v35-issue4/levenson.pdf> accessed 28 June 2009

[42]   Legal Services Commission, 'What is bail?' (South Australia, Law handbook) <http://www.lawhandbook.sa.gov.au/ch02s03s01.php> accessed 6 June 2009

[43]   Lisa M. Seghetti and Alison M. Smith, 'CRS Report for Congress, Federal Sentencing Guidelines: Background, Legal Analysis, and Policy Options' Updated June 30, 2007   <http://www.fas.org/sgp/crs/misc/RL32766.pdf> accessed 3 June 2009

[44]   M. J. J. Hall et. al., 'Supporting discretionary decision-making with Information Technology: A study in the criminal sentencing jurisdiction', (2005) University of Ottawa Law & Technology Journal

[45]   Marco Costa, Orlando Sousa and José Neves, 'An Architecture to Legal Distributed Case Repositories', (1998) *JURIX* <http://www.jurix.nl/pdf/j98-02.pdf> accessed June 26 2009

[46]   Mary T. Phillips, 'Release and bail conditions in New York' (2004) New York City Criminal Justice Agency, Research brief No. 6, August 2004   <http://www.cjareports.org/reports/brief6.pdf> accessed 7 June 2009

[47]   Michael White and Andrew Sparrow, 'Conservatives unveil plan to reform bail system' Guardian (London 11 August 2008) <http://www.guardian.co.uk/politics/2008/aug/11/justice.conservatives> accessed 17 May 2009

[48]   N. Hutton, A. Patterson, C. Tata, and J.N Wilson,. 'Decision Support for Sentencing in a Common Law Jurisdiction' (1995) Fifth International Conference on Artificial Intelligence and Law (ICAIL-95), .89–95. Washington D.C.: ACM Press.

[49]   N. Hutton, C. Tata, and J.N Wilson, 'Sentencing and Information Technology: Incidental Reform?' (1996) International Journal of Law and Information Technology 3(2): 255–285.

[50]   N. Hutton, A. Paterson, C. Tata, and J.N Wilson, 'A Sentencing Information System for the Scottish High Court of Justiciary' (Scottish Office Central Research Unit: Edinburgh 1996);

[51]   Neil Corre and David Wolchover, *Bail in Criminal Proceedings*, (3rd Edition, Oxford University Press, 2004) Chapter 1: Right to bail

[52]   Nigel Morris, 'Rise in prison suicides blamed on overcrowding' The Independent (London Friday, 17 June 2005) <http://www.independent.co.uk/news/uk/crime/rise-in-prison-suicides-blamed-on-overcrowding-494408.html> accessed 19 May 2009

[53]   Patricia Hassett, 'Can Expert Systems Improve the Exercise of Judicial Discretion?' 91992) In: Grütters, C.A.F.M., J.A.P.J. Breuker, H.J. van den Herik, A.H.J. Schmidt and C.N.J. de Vey Mestdagh (eds), *Legal Knowledge Based Systems: Information Technology & Law, JURIX'92*, Koninklijke Vermande, Lelystad, NL, 992. <http://www.jurix.nl/pdf/j92-19.pdf > accessed 24 June 2009

[54]   Patricia Hassett, 'A Prototype Expert System For Making Bail Recommendations', (1992) 7th BILETA Conference, Information Technology and Legal Education: Towards 2000, 9th & 10th April 1992

[55]   Patricia Hassett, 'Can Expert System Technology Contribute to Improved Bail Decisions?' (1993) International Journal of Law and Information Technology. Vol. 1 No. 2 Summer

[56]   Patricia Hassett, 'Problems in Selecting Effective Computer Technology for Use at the Bail Stage of the Criminal Justice System' (1990) Proceeding of the 2nd National Conference on Law, Computers and Artificial Intelligence

[57]   Patricia Hassett, 'An Expert System for Improving the Pre-trial Release/Detention Decision' (1991). Pre-Proceedings of the 6th Annual BILETA Conference

[58]   P. Alldridge, "Anoraks among the suits and jeans computers, law and the legal academy", (1997) Journal of Information, Law and Technology (JILT).

[59]   Paralegal Advisory Service (PAS), 'What is bail?' (2004)   <www.penalreform.org/resources/bro-2004-what-is-bail-en.pdf> accessed 16 May 2009

[60]   Patricia M Morgan and Paul F Henderson, 'Remand decisions and offending on bail: evaluation of the Bail Process Project' (London: Home Office, 1998) Home Office Research Studies

[61]   <http://www.homeoffice.gov.uk/rds/pdfs/hors184.pdf> accessed 18 May 2009

[62]   Peter Wilcock and Joel Bennathan, 'The new bail system' (2004) New Law Journal Issue 7126

[63]   Prison Reform Trust, 'Five ways to stem prison overcrowding', (2005) <http://www.prisonreformtrust.org.uk/subsection.asp?id=349> accessed 20 May 2009

[64]   Robert Jago, 'Civil and Criminal Procedure' <http://www.londonexternal.ac.uk/current_students/programme_resources/laws/subject_guides/civ_crim/criminal_procedure_ch 11.pdf> accessed 8 June 2009

[65]   Samantha Besson, 'Four Arguments Against Compromising Justice Internally', (2003) Oxford Journal of Legal Studies, 1 June 2003

[66]   Schmatt E. 'Judicial Information Research System (JIRS)' (1996) Judicial Officers Bulletin 8(7): 49–50. Judicial Commission of New South Wales.

[67]   Sharon Hanson, *Legal method and reasoning*, (2nd Edition Cavendish Pub Ltd, London 2003)

[68]   Sophie Goodchild, 'Public at risk from prison overcrowding' The Independent (London Sunday, 21 January 200) < http://www.independent.co.uk/news/uk/crime/public-at-risk-from-prison-overcrowding-433075.html> accessed 20 May 2009

[69]   Stephen Jones , 'Guilty until Proved Innocent? The Diminished Status of Suspects at the Point of Remand and as Unconvicted Prisoners', (2003) Common Law World Review, 1 December 2003.

[70]   Steve Chanenson, Marc Miller and Ron Wright 'Users and Uses of Sentencing Data' 92006) NASC Annual Conference <http://www.ussc.gov/states/2006conf/Chanenson%20Miller%20Wright%20Tata%20Hutton%20Plenary%20-%20Policy%20Shaping.pdf> accessed 1 June 2009

[71]   Susan Edwards, 'What shall we do with a frightened witness?' (1989) New Law Journal, 22 December 1989.

[72]   The Sentencing Commission for Scotland, 'The Scope to Improve Consistency in Sentencing' Report – 2006 <http://www.scottishsentencingcommission.gov.uk/docs/consistency/Consistency%20Report%20-%20Final.pdf> accessed 30 May 2009

[73]   The Law Commission, 'Bail and the Human Right Act 1998: Executive Summary' LawCom No 269, <http://www.lawcom.gov.uk/docs/lc269sum.pdf> accessed 5 June 2009

[74]   The Law Commission, 'Criminal Law: Bail and The Human Rights Act 1998: A Summary' (1999) Consultation Paper NO 157 <http://www.lawcom.gov.uk/docs/cp157sum.pdf> accessed 17 May 2009

[75]   The Journal Online, 'Bail system in crisis, say police chiefs: Conference call to Executive for crackdown on bail offenders' The Journal Online (London 20 May 05) <http://www.journalonline.co.uk/News/1001851.aspx> accessed 4 July 2009

[76]   Thomas F. Gordon, Henry Prakken and Douglas Walton 'The Carneades Model of Argument and Burden of Proof' (2007) <http://www.dougwalton.ca/papers%20in%20pdf/07GordonPrakkenWalton.pdf> accessed 4 August 2009

[77]   U.J Schild, 'Criminal sentencing and intelligent decision support', (1998) 6 Artificial Intelligence and Law *151*.

[78]   U.J Schild and J. Zeleznikow, 'A comparative study of decision support systems for the sentencing of criminals' (2008) Journal of Decision Systems, 17 (4):523-552.

[79]   United States Sentencing Commission, 'Federal Sentencing Guidelines Manuals' (2008) <http://www.ussc.gov/2008guid/GL2008.pdf > accessed 3 June 2009

[80]   Y. Hacohen-Kerner and U.J. Schild, 'Case-based Sentencing Using a Tree of Legal Concepts', (2001) Information & Communications Technology Law, Volume 10, Issue 1 March 2001 , pages 125 - 135

Cases
Lord Russell in R v Rose (1898) 78 LT 119
Linford v Fitzroy (1849) 13 QB 240 at 247;
R v Badger (1843) 4 QB 468 at 472 and Osborne V Gough 3 B & P 551.
R v Vallet [1951] 1 All ER 231
R(O) v *Harrow Crown Court* (2003) *The Times*, 29 May by Kennedy LJ
U.S. v. *Booker,* 543 U.S. 220 (2005)