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Research Article

Direct Government by Algorithm Towards Establishing and Maintaining Trust when Artificial Intelligence Makes the Law: a New Algorithmic Trust Compact with the People

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Abstract

Noting the coming of the *Intelligent Autonomous Machine* ('I.AM') *Species*, the author in December 2020 published the first-ever proposals for *Fundamental Articles of I.AM Cyborg Law*, and for the establishment of an *International Cyborg Regulation Authority* ('ICRA'). In papers published over the past thirty years, the author has also led expert professional thinking and analysis of *The Questionable Presumption of the Reliability of Computer Evidence*. This is an issue that has received much attention in the wake of the December 2019 *Bates -v- Post Office* English High Court decision in regard to the many previous faulty civil prosecutions arising from, and relying on, the PO's flawed Horizon system. And in April 2021, in a unique professional public Debate, the author proposed the Motion "*This House would prefer to be Governed by Algorithm direct, than by Politicians who are not ICT Professionals and who have never coded software to deliver a functionally useful Algorithm for any customer or user*". This identified the inevitability of Government By Algorithm ('GBA') - currently happening, however, in circumstances where nobody has ever been democratically asked if they are happy with Algorithmic Government or AI Law-making. Interlinking *Cyborg Law and Regulation,* the *(un)Reliability of Computer Evidence,* and *GBA,* this article emphasises the foundational importance of the concept of *Trust.* It addresses this critical *Trust* issue by way of presenting elements of a potential Manifesto for a hypothetical *Cyborg, Algorithm and Robot Party,* CARP. This proposes and provides a novel form of (politician-free) ***Direct GBA***, encompassing mechanisms for establishing a new ***Algorithmic Trust Compact*** with the People, consistent with the posit that the minimum standard demanded in tort from those purporting to hold themselves out as qualified to govern by algorithm chimes readily with the features and characteristics of *Cognitive Competence*.

Keywords: Intelligent; Algorithm; Trust; Government; AI; Automated; Decision; Machine; Cyborg; Law; Regulation; Evidence; Forensic; Robot; Software; Reliability; Cognitive; Competence; Tort; Blockchain; Cryptocurrency

Introduction

In a recent paper [1], imaginative legal principles, statutory provisions and international institutions likely to be needed to address the fast-approaching emergence of what the author has christened the Intelligent Autonomous Machine ('I.AM') Species were set forth and discussed. These imaginings included presentation of initiating proposals for Fundamental Articles of I.AM Cyborg Law, and for the establishment of an International Cyborg Regulation Authority ('ICRA').

Over the past thirty years the author has also established a body of published material concerning The Questionable Presumption of the Reliability of Computer Evidence [2]. Out of that work resulted the insight of Castell's First Dictum: "You cannot secure an ontologically unreliable technology by use of an ontologically unreliable

technology" (1990). This fundamental and important truth has received particular attention following the December 2019 English High Court decision in the Bates -v- Post Office case [3]. That judgment concerned the faulty civil prosecutions, over a twenty-year period, of hundreds of UK Sub-Postmasters and Sub-Postmistresses for alleged misappropriation of funds. The relentless pursuit of those legal actions (eventually overturned by Bates) relied for their successful prosecution on unchallenged digital evidence from the PO's defective Horizon computer software system. This has been described as 'one of the greatest miscarriages of justice in recent British legal history'.

In April 2021, at a well-attended professional public online Debate, the first of its kind held anywhere, organised jointly by the Law Specialist Group of the British Computer Society (the Chartered IT Institute), and the Society for Computers and Law, the author proposed the Motion "This House would prefer to be Governed by Algorithm direct, than by Politicians who are not ICT Professionals and who have never coded software to deliver a functionally useful Algorithm for any customer or user" [4].

The logic of the argument for the inevitability of Government By Algorithm ('GBA') was identified and declaimed, noting that wide and persistent implementation of GBA is actually already essentially in place. Worryingly, this is however being executed and foisted upon citizens without their agreement, and by generally technically-inept Government Ministers. No political party, to the best of knowledge, has ever pitched, promoted or promised such Algorithmic Government or AI Law-making in its electoral manifesto.

To be clear:

- Citizens have never been democratically asked if they desire, let alone been persuaded to accept, or been checked to see if they are happy with, GBA; and
- Despite this lacuna of a democratic mandate, GBA is happening relentlessly anyway, without, therefore, appropriate public debate, formal voter approval, nor proper (or possibly any effective) independent AI expert accountability.

Patently, GBA is here, growing, and becoming all-pervasive. GBA is furthermore currently making (up) and implementing new 'Digital Law' as it goes along. And this all happening unscrutinised, and essentially under cover, outside the democratic compact. But GBA is too powerful a 'game-changer' to continue to be undertaken and progressed like this, 'in the dark', and in the absence of independnet expert checking and monitoring.

Such checking and monitoring needs to be done under a bright spotlight, and it can only sensibly be done by experts. Such experts, as independent ombudsmen, under statute, are at the very least needed to act on behalf of citizen voters and taxpayers as to GBA's desirability, objectives, legality, design, quality, security, reliability, implementation, fitness for purpose, bias, inclusivity, objectivity, dependencies, actions and consequences arising.

However, in the current benighted circumstances, i.e. absent such statutorily-empowered independent experts 'riding shotgun' on behalf of the People, citizens have every reason to feel unease and a lack of confidence in ever-escalating GBA. This is, after all, GBA for which they never voted, nor have been provided with any direct oversight mechanism. Yet the lives of citizens are relentlessly becoming more and more subject to, and directed by, clandestine algorithmically-wielded governmental power and de facto new, unscrutinised Digital Law and Administration.

This rapidly evolving situation is highly likely to become the most all-pervasive and significant impact of AI on the Law, and on citizens subject to the Law. The principles and aspirations of good quality, trusted social and systems governance demand that the evolution of the impact of AI on the Law be honestly revealed and carried out in the open, and on a professional expert-driven and expert-scrutinized basis, Furthermore, and most importantly, as will be elaborated herein, these developments in 'Government and Legislation by Automated Decision Systems' should not be left in the hands of technically amateur politicians.

This article identifies and establishes that the constant theme, critical issue, and interlinking key foundational element, of all these three things - Cyborg Law and Regulation, the (un)Reliability of Computer Evidence, and GBA - is the concept and principle of Trust. This paper uniquely addresses this critical issue of Trust, and how that Trust may be secured, by way of presenting an illustrative maquette for the Manifesto of a putative new political entity, the Cyborg, Algorithm and Robot Party, CARP, proposing a new form of politician-free Direct GBA, encompassing mechanisms for establishing a novel Algorithmic Trust Compact with the People, consistent with the posit that the minimum standard demanded in

tort from those purporting to hold themselves out as qualified to govern by algorithm chimes readily with the features and characteristics of Cognitive Competence.

The intelligent autonomous machine ('I.AM') species, fundamental articles of I.AM cyborg law, and an international cyborg regulation authority ('ICRA') [1]

Author Isaac Asimov first fictionally proposed the 'Three Laws of Robotics' in 1942, while the word 'cyborg' appeared in 1960, describing imagined beings with both artificial and biological parts. The author's own 1973 neologisms, 'neural plug compatibility', and 'softwiring' predicted the computer software-driven future evolution of man-machine neural interconnection and synthesis, and today, Human-AI Brain Interface cyborg experiments and 'brain-hacking' devices are being trialled. The growth also of Artificial Intelligence (AI)-driven Data Analytics software and the associated increasingly pervasive GBA have revealed these advances as being largely unregulated, with insufficient legal frameworks: the impact of Artificial Intelligence on Government, and thus on the Law, and, most significantly, on citizens subject to the Law, is already well in progress, uncontrolled, and unregulated - and it is, and will increasingly be, profound, and 'game-changing'.

The author has also pointed out that, with automation of legal processes and judicial decision-making themselves being increasingly discussed and trialled, RoboJudge has in addition all but already arrived.

With few established elements of law and jurisprudence available that readily map to a Machine (Learning) Species, any new 'Cyborg Law' has to be drafted on a tabula rasa basis. Cyborg Law furthermore needs to consider that by 'Machine Species' could be meant one that is self-aware existentially, with a distinct legal personality, which the author has christened the Intelligent Autonomous Machine ('I.AM') Species ('sum ergo cogito').

The author has initiated development of Fundamental Articles of Cyborg Law ('FACLs'), setting-out putative legal text for a draft Cyborg Act 2021, constituting the first substantive attempt to develop a tangible Cyborg Law; and has also proposed the establishment of an International Cyborg Regulation Authority, ICRA.

The insight that clearly emerges is that the governance, including therefore the law-making, of democratic countries, societies and economies in this fast-approaching AI-driven and AI-dependent I.AM Species future - the Software-Seduced, Suffused and Submerged Society - cannot be left to non-expert politicians. For the good of the citizenry, indeed of humanity, it is time for those who are not educated, trained and experienced experts in computer science, in professional software and systems principles, techniques and practices, and in Information and Communications Technology (ICT), to stand down from seeking or wielding this distinctly new algorithmically-fuelled and -driven governmental power.

The questionable presumption of the reliability of computer evidence [2]

By contrast, those who are trained ICT expert professionals, educated in computer science, and with expertise and experience in software and systems principles, techniques, technologies, customs and practices, are not only specifically proficient and well-skilled in algorithmic processes and their implementation in delivered, functional, and performant computer software, but are also equally aware of the mathematical provability of the unreliability, unpredictability and undecidability of those, increasinlgy all-pervasive, computer programs.

These experts well know that 'The only thing that can be said with certainty about software is that it is definitely uncertain' [5].

The author is himself one such experienced ICT expert professional and over the past thirty years has in particular led thinking on and established a body of published forensic analytical knowledge and materials concerning The Questionable Presumption of the Reliability of Computer Evidence, having established the fundamental insight of Castell's First Dictum: "You cannot secure an ontologically unreliable technology by use of an ontologically unreliable technology" (1990).

It is well understood and accepted that 'open' von Neumann computer architecture - since its incepotion in c. 1948, still the basis for software design and construction of all commercial computer devices and systems - has always been, and remains, inherently insecure. This concern gave rise to the author's seminal 1990 APPEAL Report, a major study commissioned by the UK's CCTA (H M Treasury), on admissibility of computer evidence in court and the legal reliability/security of IT systems.

It is equally well-established that Electronic Evidence has been acknowledged to be based on the concept of a transactional chain of trust, and the author identified as far back as 1993 the latter's dependency on Trusted Third Party Services ('TTPs'): "A Trusted Third Party is an impartial organization delivering business confidence, through commercial and technical security features, to an electronic transaction. It supplies technically and legally reliable means of carrying out, facilitating, producing independent evidence about and/or arbitrating on an electronic transaction. Its services are provided and underwritten by technical, legal, financial and/or structural means".

TTPs are provided and underwritten not only by technical, but also by legal, financial, and structural means.

Given the foundational need for Trusted Third Parties (incidentally, by the Rule of Law, equally needed in the world of cryptocurrencies and digital assets [6]), it follows that those who are expert in the knowledge and nuances of the ontological unreliability of open von Neumann architecture systems should be - are, indeed, the only professional folk qualified and trusted to be - involved in the implementation, delivery and monitoring of what is clearly now required as AI increasingly impacts government and the law, and GBA becomes ever more dominant: that is, the need for a new Algorithmic Trust Compact with the People.

Direct government by algorithm ('Direct GBA')

How to achieve this new Algorithmic Trust Compact with the People?

A step in that direction was the well-attended professional public online Debate, held in April 2021, and organised jointly by the Law Specialist Group of the British Computer Society (the Chartered IT Institute), and the Society for Computers and Law. At this event, the first of its kind anywhere, the author proposed the Motion "This House would prefer to be Governed by Algorithm direct, than by Politicians who are not ICT Professionals and who have never coded software to deliver a functionally useful Algorithm for any customer or user".

The specific background to and catalyst for that Debate was that in mid-August 2020, the UK media trumpeted 'The Algorithm is Dead', referring specifically to the then 'hot' news story of the UK Government's canning of the infamous A-Level Grade-Assigning Algorithm from https://www.gov.uk/government/organisations/ofqual. The subsequent British Computer Society Policy Team report 'The Exam Question: How do we make algorithms do the right thing?' (https://www.bcs.org/more/about-us/press-office/press-releases/algorithms-must-meet-ethical-and-professional-standards-to-recover-public-trust-report-recommends/) asserted that "Algorithms that change people's lives - for example when estimating students' grades - should now meet strict standards of ethics and competence". That punchy 'Dead' journalistic phrase and the BCS Policy Team report together neatly highlighted the important topic of GBA and issues that go much wider than simply one Algorithm for the sole Application Area of 'Decision Making in Education Policy Management'.

However, British Government Cabinets have rarely, if ever, included Ministers who are skilled ICT Professionals, anyone with formal education, training or experience in computer science, anyone who has ever designed an algorithm, or debugged software source code, or managed an IT project, or written a line of substantive operational software for a customer or user. Will citizens be happy to continue to see their taxes being wasted on poorly-posed, badly directed and algorithmically-doubtful ICT systems and projects, reliant for their conception and management on inadequately technically-competent Government Ministers, in the rapidly-arriving GBA future?

Would it not be better simply to 'Elect Algorithms' and replace such human naivety with government direct by the AI which politicians themselves evidently seem increasingly, but inexpertly, to think can 'govern better than humans'?

Addressing this question, in proposing the Motion at the GBA Debate the author analysed and declaimed as follows:

{On Screen Avatar}: "*Brothers and Sisters, welcome to the Post-Politics Paradise, The Algorithmic Elysium. GOTO is in Heaven, all's well with the Code*".

Introduction

Those words are what I glimpse could be the start of the Maiden Speech by the Prime Algorithm of the first Cyborg Government at the Opening of e-Parliament, in, say, 2050 or thereabouts. The Prime Algorithm, the Leader of the Government By Algorithm, will be an Avatar, a Cyborg. Actually, not even simply a Cyborg; but a member of what I have christened the Intelligent Autonomous Machine Species, or I.AM Species.

I foresee this not because I yearn for the human species to be replaced by such new evolved beings, 'bio-logical amalgams'. No, it's because this is inevitably going to happen, one way or another. Indeed, it's already beginning to happen. And this evening, Ladies and Gentlemen, I want to convince you that the way it happens, the control over the pace at which it happens, and who gets to decide how this Algorithmic Elysium develops, cannot and must not be left to technically unskilled politicians.

The argument for the motion

The argument for this Motion is powerful, clear, and straightforward:

- We are now governed by algorithm anyway.
- Politicians are not fit to design algorithms, and design terribly bad ones.
- We would be better off having Direct Government By Algorithm, where the governing algorithms needed are themselves designed by an algorithm; and an algorithm that is susceptible to 'doing the optimally beneficial thing' based on direct public input.

Point number 1

So yes, Government By Algorithm - let us shorten it to GBA, to save breath - is going to happen anyway; because it has already begun. For to govern is to choose. Government, national choosing, state decision-making, has actually always been algorithmic.

And today, the use of computer software-drive algorithmic AI and Data Analytics for 'governmental choosing' is common and becoming ever more widespread. Computer software-implemented algorithmic decision-making, in both Central and Local Government, has arrived, and it's here to stay. You can Do Your Own Research, and you will be in no doubt: Reliance on AI, computerised autonomous national and local governmental decision making is galloping ahead (I have indicated the extent of this in the Reading List circulated to participants in this Debate) [7].

However, this current GBA is happening on a clandestine basis. No Political Party has ever had in its Manifesto that it intends to institute a Policy of Government By Algorithm. Furthermore, the algorithms being increasingly designed, built, and deployed for automatic national and local decision-making are dreamt-up, implemented, authorised and put into practice on a largely shadowy, unscrutinised, unaccountable basis.

So, this is Point 1: existentially, we are undoubtedly governed by computerised autonomous algorithmic decision-making anyway. We have already arrived at GBA - but on a non-mandated, secretive, unmonitored basis. It's happening now, and will increasingly happen in future.

Point number 2

I submit that, as we accelerate rapidly now into the AI, Machine-Learning, intelligent computer software, systems and network data-powered autonomous decision-making future, we do not want our public algorithms, our national decision-making, and thus our government, controlled and driven by politicians.

Why not? Well, defining requirements for algorithms; designing, coding and delivering them; successfully managing the useful operational deployment of quality computer software and systems: these are the most complex and difficult intellectual and organisational activities that humans have ever devised. Only a small - the very cleverest - proportion of the population are intellectually equipped to do it, at all, let alone well. And that super-clever cohort mostly does not include politicians.

It is no surprise therefore that British Government Cabinets have rarely included politicians who are skilled ICT Professionals. Ministers are not generally drawn from anyone with education, training and experience in computer science, anyone who has ever designed an algorithm, or debugged software source code, or managed an IT project, or anyone who has written even a line of substantive operational software for a customer or user.

The outcome? Simply look at the evidence of the track-record of politicians with regard to badly conceived, poorly executed and financially wasteful Government ICT project failures. Once again, Do Your Own Research, and you will readily find that UK government IT project disasters are legendary. Billions of pounds of taxpayers' money have repeatedly been wasted on hastily or ideologically conceived, poorly researched or specified, inadequately procured, unintelligently designed, badly managed, thoughtlessly imple-

mented, public IT systems - by the way, often causing emotional anguish, practical problems, and financial hardship to those least advantaged in society.

Point number 3

To recap: I say that, despite the consistently disastrous track-record of public ICT projects, we now have software-coded algorithms increasingly being wilfully and carelessly implemented by government - some say, even deviously and suspiciously, with conscious or unconscious bias. These algorithms are being conceived and deployed by the wrong people: politicians, who are non-ICT Professionals, and fundamentally unskilled and inept ICT project managers.

And this escalating activity is taking place behind closed government doors. It is unmonitored as to defining and agreeing national algorithmic objectives and requirements. There is no independent expert checking of algorithmic design, robustness and security, nor auditing of competent software construction to established ICT professional standards, nor assessing of overall fitness for purpose.

So, it is time to halt this badly-managed, unaccountable process, this suspect 'government by algorithmic amateurs'. Enough of unskilled inept algorithmic government amateurism! We need a professional path to Direct GBA.

But how can Direct GBA work, how can it be put in place? That is a good question, and the answer to it, I suggest, will of course be - an algorithm! What I call the GBA Genesis Algorithm. We need to devise a methodology for citizens to be able to participate in proposing, creating, refining, designing, developing, agreeing, delivering and auditing this GBA 'Genesis Algorithm'. That mechanism will then itself become the model for citizens' directly producing, endorsing and owning the many other public algorithms, openly defined, and mandated by citizens themselves, that will become the future Direct GBA. And of course: 'politicians not wanted or needed here, move along please'.

Is this undemocratic? No, not at all. My distinguished Seconder for the Motion, Matthew Lavy, of Counsel, will address the democratic governance issues (https://www.4pumpcourt.com/barrister/matthew-lavy/). Note that this proposition is not anything like the nineteenth-century notion of epistocracy.

Now we can be pretty sure that existing politicians will not take up my proposals. By definition, they will wish to continue politics, and in politics. What I am proposing goes beyond politics: it is the replacement of politics with what I call Cybernetic Humanitics. But realistically, to achieve Direct GBA, for expediency we may need to beat politicians at their own game, and form a new political party. How about the 'Cyborg, Algorithm and Robot Party', CARP?

Conclusion

So, Ladies and Gentlemen, CARP-E DIEM! Vote for Direct GBA! I plead for changing the system. Not for reform. Not for just making the existing benighted GBA system - run by entirely the wrong people, ICT-inept politicians - better served by and with algorithms. No, I propose replacing politics with Cybernetic Humanitics. Abandoning government by politicians and adopting Direct GBA. Clandestine GBA is happening already, remember; we are being 'suckered into it', anyway!

To sum up

So, I propose Direct GBA, where the People's Algorithms are not just responsive to the People but democratically chosen by them, defined by them, shaped by them, approved by them, monitored by them, OWNED by them. How do we do that? How to build a practical, workable Direct GBA government, and governance, model? Why, by way of an Algorithm, of course. What I have called the Genesis Algorithm. Ladies and Gentlemen, Vote Direct GBA! Vote CARP!

{On-Screen Avatar}: *" I passionately hope that you will please vote for tonight's Motion: This House would prefer to be Governed by Algorithm direct, than by Politicians who are not ICT Professionals and who have never coded software to deliver a functionally useful Algorithm for a single customer or user".*

Conclusion: Trust - A CARP manifesto; and cognitive competence

The constant theme, the interlinking key foundational element, of all three topics covered in this paper, Cyborg Law and Regulation, the (un)Reliability of Computer Evidence, and GBA is the important concept and principle of Trust.

To emphasise: despite the absence of a democratic mandate, GBA is happening anyway - without substantive public debate, approval, or proper accountability. This unpleasant and unwelcome development is clearly emerging as one of the most significant impacts of AI on the Law, and its Administration. Citizens have ev-

ery reason to feel anxiety and a lack of trust in this current mode of ever-escalating GBA, for which they never voted and have been given no mechanism for monitoring or controlling. Yet the lives of those citizens are becoming more and more subject to clandestine algorithmically-wielded governmental power, and to evolving unscrutinised Digital Law and Adminstration.

To fix this democtratically aberrant and dangerous situation, the author has set out herein a novel analysis and proposition for Direct GBA, leading to the proposal of the formation of a potential new entity, a political party, the 'Cyborg, Algorithm and Robot Party', CARP. If there were to be such an entity, its Manifesto pitch and pledge would probably include:

- **The Message:** 'End politics, support humanitics. Cyborgs are coming, like it or not. Humans cannot avoid or reject them'.
- **The Solution**: 'We must positively embrace, absorb, control and integrate with Cyborgs'.
- **The Promise**: 'CARP will give every citizen a chance, indeed the right, to become a member of the I.AM Species. Most importantly, CARP will give every citizen an active voice in defining, agreeing and owning the quality algorithms they wish to choose to govern them. 'To govern is to choose. To choose your algorithm is to govern. Let the People choose. Let the People govern'.
- **The Pledge**: 'CARP will, uniquely, work with all citizens to establish a new Algorithmic Trust Compact with the People'.
- **The Call**: 'Vote for Humanitics! Vote for Direct GBA! Trust in CARP!'.

Now, there may be a natural, and understandable, hesitancy or inertia amongst citizens to follow and adopt the analysis and conclusions elaborated in this article, given that they lead to the author's proposition that Politics should be replaced by Cybernetic Humanitics: 'politicians not further needed or wanted on journey'. Such is the People's worthy aspiration and passion for democracy, and the constant struggle to monitor, maintain and adhere to democracy, once established, that an automatic atavistic fear and alarm springs out if a practical, new system of government be suggested, that is perceived to be radically different from 'the norm hitherto'.

But the People have no cause to be troubled: democracy was never posited nor defined as a system requiring politicians. 'Government of the People, by the People, for the People' does not mention them. A cohort of politicians, and 'party politics', are artificial constructs introduced as just one pragmatic, imperfect mechanism for achieving democracy. There is nothing sacred or fundamental about these 'political' constructs. As Sir Winston Churchill memorably said, "Representative Parliamentary Democracy is the worse system of government ever devised - except compared to anything else that has been tried".

So far, so least worse; but, hang on, Sir Winston's pragmatic, imperfect mechanism is already becoming redundant. To re-iterate: a new, different system of government, GBA, is now happening, stealthily creeping-in, anyway. The existing cohort of politicians, whether with deliberate 'systemic change' intentions or not, are already ditching the established politician-dependent model of democratic government and replacing it by ever-escalating introduction and active deployment of GBA - unheralded, clandestinely, unmonitored, and with no democratic mandate to do so. Government-commissioned, government-deployed, government-imposed software, algorithms, machine learning, data science, and Automated Decision Systems, and the consequences and actions arising therefrom, are increasingly and relentlessly being foisted by the current cohort of politicians on citizens, with associated escalating introduction - and without substantive public debate - of de facto Digital Law and Administration.

Yes, it is politicians who are effectively replacing themselves by algorithms, and by algorithmic implementation in computer software. However, politicians are, as a cohort, technically unskilled, inexperienced, inept and incompetent as regards undertaking the complex technical analyses and judgements necessary for, and the proficient professional management of, such an algorithm-driven, software-implemented, computer systems-powered 'democratic replacement' exercise. It is a fact that, as a community, politicians are not, nor rarely include, ICT Professionals.

It is perfectly reasonable therefore for citizens to conclude that GBA that is non-democratically mandated, secretly conceived, and ineptly imposed by non-algorithmically competent politicians is

simply not democratically acceptable. And it is equally reasonable for citizens to seek and welcome a new system - still democratic, if not more so - where the algorithms that govern, rule, protect and inspire them, and that are responsible for securing their safety, health, employment, homes, travel, and financial wellbeing, are conceived, designed, implemented, deployed, maintained and monitored by algorithmically competent independent experts, acting directly on the People's behalf.

Such a new system is Direct GBA, a novel form of - robustly democratic - government, uniquely establishing a necessary new Algorithmic Trust Compact with the People. Direct GBA's Cybernetic Humanitics delivers People's Algorithms, that are not just responsive to the People but democratically chosen by them, defined by them, shaped by them, approved by them, monitored by them, OWNED by them.

One cannot emphasize too strongly the need for this new Algorithmic Trust Compact, i.e. for GBA to be conceived, designed, implemented, deployed, maintained and monitored by independent experts, that is, to repeat, those who are algorithmically competent, acting on the People's behalf, and not by a cohort of politicians who fundamentally lack such capacity.

In regard to identifying and understanding in this context what 'being competent' means, what this 'competence' requires, what are the technical and legal norms and expectations for 'competence', it is submitted that what should be noted, and relevantly apply, is the standard demanded in tort from those professing qualifications, leadership, expertise and experience - i.e. competency - in their field, where in this case the specialist field of expertise is that of governing by algorithm.

That tortious standard, i.e. the benchmark by which to be judged, to avoid accusation or allegation of committing a tort, 'an act or omission that gives rise to injury or harm to another and amounts to a civil wrong for which courts impose liability', is typically expressed, at a minimum, as demanding and requiring 'use of reasonable professional skill, care and diligence' on behalf of anyone to whom is owed an express or implied responsibility of representation, management, care, protection and/or other fiduciary or contractual duty.

Quite clearly, the current cohort of politicians, in general, are algorithmically, technically and technologically incapable, untrained in computer science, unskilled in software development, inexpert and inexperienced in complex project management. They are simply therefore fundamentally incapable of discharging their algorithmic governance fiduciary duty to the People, i.e. of meeting the minimum standard demanded in tort of those purporting to hold themselves out as qualified in the specialist field of governing by algorithm. It is gently suggested that, doing the 'decent thing', they should forthwith honorably excuse themselves from any further such express or implied claim, representation or involvement.

The author further posits that this minimum standard demanded in tort from those purporting to hold themselves out as qualified to govern by algorithm chimes readily with the features and characteristics of Cognitive Competence, an important concept receiving increasing scholarly attention, study and analysis **[8]**. Put succinctly, the posit is that the cohort of politicians is simply not cognitively competent to govern by algorithm.

There is clearly a paper to be written analysing the extent to which (if at all) the current cohort of politicians, and that cohort's evident general intellectual incapability and technical incapacity to govern algorithmically, i.e. to manage the empowerment of Automated Decision Systems, and (without democrratic mandate) to introduce Government by Algorithm, and Cyber Law, qualifies that cohort to be cognitively competent so to govern.

For the moment, the author leaves that paper to be written by others. Equally, however, on present analysis, the suspicion is that there would be little doubt as to its conclusions.

Note: Numbers given within text in square brackets, in bold type, for example [1], point to a source, or a group of sources, provided and set out at end, under section. Background Reading, Materials and Discussion.

Background Reading, Materials and Discussion

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https://www.postofficetrial.com/2021/06/marshall-spells-it-out-speech-to.html

Michael Jackson, 'An approach to the judicial evaluation of evidence from computers and computer systems' https://journals.sas.ac.uk/index.php/deeslr

https://twitter.com/BillMew/status/1394928255677964291?s=20

Paul Marshall, James Christie, Peter Bernard Ladkin, Bev Littlewood, Stephen Mason, Martin Newby, Jonathan Rogers, Harold Thimbleby and Martyn Thomas CBE, 'Recommendations for the probity of computer evidence', 18 Digital Evidence and Electronic Signature Law Review (2021), 18-25. https://journals.sas.ac.uk/deeslr/article/view/5240

Draft Convention on Electronic Evidence, for which see article 4 - replicated at para 7.128 in Electronic Evidence https://journals.sas.ac.uk/deeslr/article/view/2321

Peter Bernard Ladkin, Bev Littlewood, Harold Thimbleby and Martyn Thomas CBE, 'The Law Commission presumption concerning the dependability of computer evidence', 17 Digital Evidence and Electronic Signature Law Review (2020) 1-14.

https://journals.sas.ac.uk/deeslr/

Peter Bernard Ladkin, 'Robustness of software', 17 Digital Evidence and Electronic Signature Law Review (2020) 15 - 24 https://journals.sas.ac.uk/deeslr/

James Christie, 'The Post Office Horizon IT scandal and the

presumption of the dependability of computer evidence', 17 Digital Evidence and Electronic Signature Law Review (2020) 49 - 70 https://journals.sas.ac.uk/deeslr/

'The harm that judges do - misunderstanding computer evidence: Mr Castleton's story', Paul Marshall, 17 Digital Evidence and Electronic Signature Law Review (2020) 25 - 48 https://journals.sas.ac.uk/deeslr/article/view/5172

https://www.independent.co.uk/news/business/news/post-office-high-court-case-it-horizon-postmaster-prison-latest-a9249431.html

https://www.dailymail.co.uk/news/article-8787529/Fresh-fiasco-Post-Office-staff-boycott-inquiry-scandal.html

https://www.mirror.co.uk/money/city-news/fears-post-office-go-bust-23807745

https://www.cwu.org/ltb/ltb-292-19-post-office-horizon-trial-bates-others-vs-post-office-ltd/

https://www.ft.com/content/0138cd7d-9673-436b-86a1-33704b29eb60

Note: The author was approached to be expert witness on a Horizon system case right at the start of the affair, in c. 1999. If the solicitor seeking the author's assistance with one of those first PO Horizon actions could have obtained Legal Aid to engage the author professionally on behalf of the sub-postmistress client; and if that Legal Aid would have been of sufficient level to allow the author to persist in his standard penetrating technical forensic investigation demands for and analysis of the computer evidence (evidence which only the PO held); then it is highly probable that the author would have identified, revealed, explained and/or demonstrated the fault(s) which, absent the author's involvement, were undiscovered and/or ignored when proceedings were subsequently pursued by the PO with legal actions over the next two decades, against hundreds of other sub-postmasters and sub-postmistresses. It may then have been that much of the twenty-year saga of flawed PO prosecutions based on the faulty Horizon system evidence could have been truncated, or avoided all together.

The author's personal experience, from the hundreds of cases in which he has been involved as computer expert witness over the past 35+ years, is generally that, if the legal and expert team have the skill, knowledge and experience to frame Requests For Information, and demands for discovery/disclosure, in a properly effective way, no judge refuses them. This often involves Affidavits from the expert explaining why certain computer software and system documentation and evidence, which the experienced expert knows must be there somewhere, are important, indeed vital and critical, to preparation of the client's case.

[4] The Government by Algorithm Debate

https://www.bcs.org/events/2021/april/webinar-the-government-by-algorithm-d/

The Government by Algorithm Debate

BCS Law Specialist Group and Society for Computers and Law

Online Webinar: Thursday, April 15th, 2021, 18:30-20:00

https://www.bcs.org/membership/member-communities/law-specialist-group/committee/ https://www.scl.org/

The Motion: "This House would prefer to be Governed by Algorithm direct, than by Politicians who are not ICT Professionals and who have never coded software to deliver a functionally useful Algorithm for any customer or user".

Motion Proposed by: Dr Stephen Castell Motion Opposed by: Dr Nigel Young

Seconder to Proposer of Motion: Matthew Lavy, Barrister Seconder to Opposer of Motion: Shobana Iyer, Barrister

Moderator of the Debate: Rachel Free, Patent Attorney.

[5] Gödel's Incompleteness Theorems, the Halting Problem, and the Undecidability of computer software algorithms

https://people.idsia.ch/~juergen/goedel-1931-founder-theoretical-computer-science-AI.html

'1931: Kurt Gödel, founder of theoretical computer science, shows limits of math, logic, computing, and artificial intelligence', Jürgen Schmidhuber (June 2021)

Abstract. In 2021, we are celebrating the 90th anniversary of Kurt Gödel's groundbreaking 1931 paper which laid the foundations of theoretical computer science and the theory of artificial intelligence (AI). Gödel sent shock waves through the academic community when he identified the fundamental limits of theorem proving, computing, AI, logics, and mathematics itself. Since science is about self-correction, let me know under juergen@idsia.ch if you can spot any remaining error. …

https://www.youtube.com/watch?v=la6BK5X2LI8 Godel's Incompleteness Theorem - Intro to Theoretical Computer Science

https://www.udacity.com/course/intro-to-theoretical-computer-science--cs313

https://www.cairn.info/revue-internationale-de-philosophie-2005-4-page-513.htm

See also Castell's Second Dictum: "You cannot construct an algorithm that will reliably decide whether or not any algorithm is ethical" (2017), in 'The future decisions of RoboJudge HHJ Arthur Ian Blockchain: Dread, delight or derision?', Castell, S. (2018), Computer Law and Security Review, Volume 34, Issue 4, August 2018, Pages 739-753, the Landmark 200th issue of CLSR under the Editorship of Emeritus Professor Steve Saxby. https://doi.org/10.1016/j.clsr.2018.05.011.

https://www.cutter.com/article/forensic-systems-analysis-methodology-assessment-and-avoidance-it-disasters-and-disputes

https://www.cutter.com/article/forensic-systems-analysis-methodology-assessment-and-avoidance-it-disasters-and-disputes-0

[6] Towards a CryptoSure Trust Model for Crypto-economics

https://www.expertwitness.co.uk/articles/journal/in-a-new-survey-a-majority-of-attorneys-and-expert-witnesses-call-for-increased-cryptocurrency-regulation

"I, Bitcoin": As told to Stephen Castell, The World Financial Review, June 16, 2021, by Stephen Castell https://worldfinancialreview.com/i-bitcoin-as-told-to-stephen-castell/

Inspired by, and paying homage to, the quintessential 1958 essay on free-market economics, "I, Pencil", by Leonard Read (https://fee.org/resources/i-pencil/), Dr. Stephen Castell adapts and refashions its lyrical narrative to illuminate bitcoin's multidimensionality: the cryptocoin's digital complexity, existential vacuity, absence of the Invisible Hand, and potentially damaging environmental impact.

'Slaying the Crypto Dragons: Towards a CryptoSure Trust Model for Crypto-economics | Blockchain vs. Trust: The Expert's View of the Crypto Scammers',

by Dr Stephen Castell, CASTELL Consulting; Chapter in the Springer-SIST book "Blockchain Technology and Innovation in Business Process", published March 2021:

https://www.researchgate.net/publication/350361916_Slaying_the_Crypto_Dragons_Towards_a_CryptoSure_Trust_Model_for_Crypto-economics_Blockchain_Versus_Trust_The_Expert's_View_of_the_Crypto_Scammers

Blockchain Technology and Innovations in Business Processes, 03/2021: pages 49-65; ISBN: 978-981-33-6469-1, DOI:10.1007/978-981-33-6470-7_4

The eBook ISBN - 978-981-33-6470-7 (https://link.springer.com/book/10.1007/978-981-33-6470-7)

The Chapter DOI - 10.1007/978-981-33-6470-7_4 (https://link.springer.com/chapter/10.1007/978-981-33-6470-7_4).

Recording of the author's interview about his QE2-Coin proposal to the UK Government, by Jonny Fry, Friday, 26th February, 2021, on the Digital Bytes Show on Blockchain Radio:

https://www.mixcloud.com/BlockchainRadio/digibytes-guest210226/

https://www.experts.com/articles/blockchain-cryptocurrency-tracing-disputes-digital-forensics-evidence-by-dr-stephen-castell

'Blockchain vs Trust: The Fundamental Expert Dilemma', Dr Stephen Castell, published in the Winter 2019 Forensics Edition of the Expert Witness Journal.

'AUTHORED BY AI Here be crypto dragons: it's all about the evidence, proclaims the CastellGhostWriteBot', Dr Stephen Castell, Solicitors Journal, October 2019, pp 43-45.

https://www.solicitorsjournal.com/sjarticle/Authored%20by%20AI

[7] Reading List - The Government by Algorithm Debate

'To Govern is to choose'. 'To Create an Algorithm is to choose'.

To Create an operational Algorithm is to choose, and implement, Requirements.

Henry A Kissinger, Eric Schmidt and Daniel Huttenlocher, 'The Age of AI : And Our Human Future'. John Murray Press, 16 Nov 2021, 272 pages,. ISBN13 9781529375978.

https://drive.google.com/file/d/1ZaBPsfor_aHKNeeyXxk9u-JfTru747EOn/view

REGULATION ON A EUROPEAN APPROACH FOR ARTIFICIAL INTELLIGENCE

Leslie, D., Burr, C., Aitken, M., Cowls, J., Katell, M., and Briggs, M. (2021). 'Artificial intelligence, human rights, democracy, and the rule of law: a primer.' The Council of Europe. The Alan Turing Institute. With a foreword by Lord Tim Clement-Jones.

https://www.turing.ac.uk/sites/default/files/2021-03/cahai_feasibility_study_primer_final.pdf

https://journalsonline.academypublishing.org.sg/Journals/Singapore-Academy-of-Law-Journal-Special-Issue/Current-Issue

https://journalsonline.academypublishing.org.sg/Journals/Singapore-Academy-of-Law-Journal-Special-Issue/Current-Issue/ctl/eFirstSALPDFJournalView/mid/503/ArticleId/1602/Citation/JournalsOnlinePDF

Daniel Seng and Stephen Mason, 'Artificial Intelligence and Evidence', (2021) 33 SAcLJ 241

https://www.cbinsights.com/research/report/enterprise-ai-trends-2021/

Enterprise AI Trends To Watch In 2021 We break down no-code AI, stream processing, data governance, and other top AI trends for businesses to consider. Artificial intelligence is here to stay. AI companies raised a record $33B in equity funding in 2020. As commercial applications of AI scale rapidly, enterprises want to become "AI-first" by upgrading their existing data management and IT infrastructure. Organizations are seeking best practices for sourcing and storing big data in different formats, deploying AI models, monitoring their performance, and developing ethical solutions that are compliant with new regulations. … Trends include: No-code AI platforms take off Graph neural nets find mainstream enterprise applications AIOps: IT and DevOps automation gains traction Analytics vendors increase support for unstructured data types Data governance and explainable AI

https://consoc.org.uk/tackling-the-algorithm-in-the-public-sector/

Tackling the algorithm in the public sector By: Tim Clement-Jones 19th March 2021

Lord Clement-Jones CBE is the House of Lords Liberal Democrat Spokesperson for Digital and former Chair of the House of Lords Select Committee on Artificial Intelligence (2017-2018). Algorithms in the public sector have certainly been much in the news …. The use of algorithms in government - and more specifically, algorithmic decision-making - has come under increasing scrutiny.

https://twitter.com/darrenpjones/status/1369409610105372675

Darren Jones MP 9 Mar 2021. Tomorrow at 10:30AM I have a (bit niche) debate in Westminster Hall on the legal status of computer based decisions. The law in this area is out of date but the consequences are increasingly significant.

https://themarkup.org/ask-the-markup/2021/02/23/can-auditing-eliminate-bias-from-algorithms

Can Auditing Eliminate Bias from Algorithms? By Alfred Ng February 23, 2021.

A growing industry wants to scrutinize the algorithms that govern our lives—but it needs teeth.

https://www.ipsos.com/en/shaping-2025-and-beyond

Shaping 2025 and Beyond is a new report from Ipsos Futures experts which describes plausible, thought-provoking scenarios of what the next five years may bring, helping governments, businesses and societies strategise for 2025 and beyond. 19 February 2021.

https://www.gov.uk/government/publications/ai-roadmap

Independent report AI Roadmap Published 6 January 2021. An independent report, carried out by the AI Council, providing recommendations to help the government's strategic direction on AI.

https://publications.parliament.uk/pa/ld5801/ldselect/ldliaison/196/196.pdf

HOUSE OF LORDS Liaison Committee 7th Report of Session 2019-21 AI in the UK: No Room for Complacency Published 18 December 2020 HL Paper 196.

https://www.globalgovernmentforum.com/uk-review-mandatory-transparency-use-algorithms-in-public-sector/

UK review urges mandatory transparency on use of algorithms in public sector. Catherine Early on 01/12/2020.

There should be a "mandatory transparency obligation" for UK public sector organisations that use algorithms to make decisions affecting people's lives, an independent review has advised. The Centre for Data Ethics and Innovation (CDEI), a panel that advises the UK government on artificial intelligence and data-driven technology, said public bodies should be required to publish information on how the decision to use an algorithm was made, the type of algorithm used, how it was used, and the steps taken to ensure fair treatment. Transparency is needed to "build and maintain public trust", the CDEI said in its final report on the risk of bias in algorithmic decision-making, commissioned by the UK government in 2018. The report is expected to kick off work with the Cabinet Office's Government Digital Service to embed its principles into public sector operations. …

https://www.gov.uk/government/publications/cdei-publishes-review-into-bias-in-algorithmic-decision-making/main-report-cdei-review-into-bias-in-algorithmic-decision-making

Independent report Review into bias in algorithmic decision-making Published 27 November 2020.

Preface Fairness is a highly prized human value. Societies in which individuals can flourish need to be held together by practices and institutions that are regarded as fair. What it means to be fair has been much debated throughout history, rarely more so than in recent months. Issues such as the global Black Lives Matter movement, the "levelling up" of regional inequalities within the UK, and the many complex questions of fairness raised by the COVID-19 pandemic have kept fairness and equality at the centre of public debate. Inequality and unfairness have complex causes, but bias in the decisions that organisations make about individuals is often a key aspect. The impact of efforts to address unfair bias in decision-making have often either gone unmeasured or have been painfully slow to take effect. However, decision-making is currently going through a period of change. Use of data and automation has existed in some sectors for many years, but it is currently expanding rapidly due to an explosion in the volumes of available data, and the increasing sophistication and accessibility of machine learning algorithms.

https://www.theguardian.com/society/2020/oct/28/nearly-half-of-councils-in-great-britain-use-algorithms-to-help-make-claims-decisions

Nearly half of councils in Great Britain use algorithms to help make claims decisions Sarah Marsh and Niamh McIntyre Wed 28 Oct 2020.

Tools used widely to inform decisions on everything from housing to school places despite concerns over accuracy Nearly half of councils in England, Wales and Scotland have used or are using computer algorithms to help make decisions about benefit claims, who gets social housing and other issues, despite concerns about their reliability. A Guardian freedom of information investigation has established that 100 out of 229 councils have used or are using automated decision-making programmes, many without consulting at all with the public on their use. This is despite one council admitting that results from one algorithm showed it was only 26% accurate in some instances. The company behind it said it was because people often entered information wrongly.

https://automatingsociety.algorithmwatch.org/

AUTOMATING SOCIETY REPORT 2020.

https://www.global-counsel.com/insights/blog/uk-governments-use-algorithms-missing-beat

Is the UK Government's use of algorithms missing the beat? TMT 28 Sep 2020.

The pressure on governments to cut costs and increase efficiency in core governance functions is set to increase. In the UK, the covid-19 pandemic has brought a huge expansion of public spending, while at the same time posing challenges to how public services are delivered. Artificial intelligence (AI) technologies and applications could form part of the solution. They could reduce the cost of core governance functions, improve the quality and speed of decisions, and unleash the power of public data … However, the use of AI in the UK public sector has taken a hit this summer. … the Department for Education made a significant U-turn over the algorithm used to determine the A-level results of students … This was an excellent example of the pitfalls of technology: what may look fair based on complex modelling may not last long in the cauldron of public opinion.

https://theconversation.com/not-just-a-levels-unfair-algorithms-are-being-used-to-make-all-sorts-of-government-decisions-145138

Not just A-levels: unfair algorithms are being used to make all sorts of government decisions 3 septembre 2020.

The recent use of an algorithm to calculate the graduating grades of secondary school students in England provoked so much public anger at its perceived unfairness that it's widely become known as the "A-levels fiasco". As a result of the outrage - and the looming threat of legal action - the government was forced into an embarrassing U-turn and awarded grades based on teacher assessment. Prime Minister Boris Johnson has since blamed the crisis on what he called the "mutant" algorithm. But this wasn't a malfunctioning piece of technology. In marking down many individual students to prevent high grades increasing overall, the algorithm did exactly what the government wanted it to do. The fact that more disadvantaged pupils were marked down was an inevitable consequence of prioritising historical data from an unequal education system over individual achievement. But more than this, the saga shouldn't be understood as a failure of design of a specific algorithm, nor the result of incompetence on behalf of a specific government department. Rather, this is a significant indicator of the data-driven methods that many governments are now turning to and the political struggles that will probably be fought over them.

https://www.lordclementjones.org/2021/04/05/the-governments-approach-to-algorithmic-decision-making-is-broken-heres-how-to-fix-it/

The government's approach to algorithmic decision-making is broken: here's how to fix it LORD CLEMENT-JONES, CO-CHAIR OF THE ALL PARTY PARLIAMENTARY GROUP ON AI 18TH FEBRUARY 2020.

I recently initiated a debate in the House of Lords asking whether the government had fully considered the implications of decision-making and prediction by algorithm in the public sector. Over the past few years we have seen a substantial increase in the adoption of algorithmic decision-making and prediction or ADM across central and local government. An investigation by the Guardian last year showed some 140 of 408 councils in the UK are using privately-developed algorithmic 'risk assessment' tools, particularly to determine eligibility for benefits and to calculate entitlements. Experian, one of the biggest providers of such services, secured £2m from British councils in 2018 alone, as the New Statesman revealed last July.

https://www-cdn.law.stanford.edu/wp-content/uploads/2020/02/ACUS-AI-Report.pdf

Government by Algorithm: Artificial Intelligence in Federal Administrative Agencies.

REPORT SUBMITTED TO THE ADMINISTRATIVE CONFERENCE OF THE UNITED STATES February, 2020

David Freeman Engstrom, Stanford University; Daniel E. Ho, Stanford University; Catherine M. Sharkey, New York University; Mariano-Florentino Cuéllar, Stanford University and Supreme Court of California (122 pages; including 30 pages of Endnotes and References).

This report was commissioned by the Administrative Conference of the United States in furtherance of its mission to "study the efficiency, adequacy, and fairness of administrative procedure"; "collect information and statistics from agencies and publish such reports as it considers useful for evaluating and improving administrative procedure"; and to "improve the use of science in the regulatory process." 5 U.S.C. §§ 591, 594.

Conclusion Across the federal government, we are beginning to observe the dawn of a new chapter—perhaps even a digital revolution—in how government does its work. Half of surveyed agencies have experimented with AI/ML. AI-based governance tools already touch virtually every aspect of government, from enforcement to adjudication and from regulatory analysis and monitoring to citizen services. And though the sophistication of many of these tools lags behind the private sector, the pace of AI/ML development in government seems to be accelerating. Few, however, have recognized, much less captured in any substantial detail, the breadth and depth of this transformation or the extent to which it is already underway. Until now, the state of knowledge about algorithmic governance has been marked above all else by its generality. The resulting high-abstraction mappings of concepts and core trade-offs have laid a valuable foundation. But further progress in thinking about the optimal regulation of the new AI governance tools is unlikely to take the form of a unified field theory. Instead, it will require a relentlessly interdisciplinary approach that engages with, rather than abstracting away from, the technical and operational details of the government's new algorithmic toolkit. This report has provided the first comprehensive effort to provide such an analysis by examining in detail what agencies are actually doing and then offering concrete recommendations for how agency officials, judges, and legislators should respond.

https://columbialawreview.org/content/cyborg-justice-and-the-risk-of-technological-legal-lock-in/

Rebecca Crootof, 'Cyborg Justice' and the Risk of Technological-Legal Lock-In, 119 COLUMBIA LAW REVIEW 233, 243 (2019).

https://unesdoc.unesco.org/ark:/48223/pf0000367823

'Preliminary study on the Ethics of Artificial Intelligence', SHS/COMEST/EXTWG-ETHICS-AI/2019/1 Paris, 26 February 2019, 32 pages. Corporate author: World Commission on the Ethics of Scientific Knowledge and Technology. Building on the work of COMEST on Robotics Ethics (2017) and on the Ethical Implications of the Internet of Things (IoT), this preliminary study is prepared by a COMEST Extended Working Group on Ethics of Artificial Intelligence.

https://www.libdemvoice.org/to-govern-is-to-choose-59934.html

"To govern is to choose" By Lord William Wallace | Mon 11th February 2019

One of the first aphorisms I learned when studying history and politics was: 'To govern is to choose'. Good government means taking decisions, even when they are hard decisions.

https://rm.coe.int/algorithms-and-human-rights-en-rev/16807956b5

ALGORITHMS AND HUMAN RIGHTS Study on the human rights dimensions of automated data processing techniques and possible regulatory implications.

PREPARED BY THE COMMITTEE OF EXPERTS ON INTERNET INTERMEDIARIES (MSI-NET) Published by the Council of Europe, March 2018, DGI(2017)12

... Automated data processing techniques, such as algorithms, do not only enable internet users to seek and access information, they are also increasingly used in decision-making processes, that were previously entirely in the remit of human beings. Algorithms may be used to prepare human decisions or to take them immediately through automated means. In fact, boundaries between human and automated decision-making are often blurred, resulting in the notion of 'quasi- or semi-automated decision-making'. The use of algorithms raises considerable challenges not only for the specific policy area in which they are operated, but also for society as a whole. How to safeguard human rights and human dignity in the face of rapidly changing technologies? The right to life, the right to fair trial and the presumption of innocence, the right to privacy and freedom of expression, workers' rights, the right to free elections, even the rule of law itself are all impacted. Responding to challenges associated with 'algorithms' used by the public and private sector, in particular by internet platforms is currently one of the most hotly debated questions. There is an increasing perception that "software is eating the world" (Andreessen 2011), as human beings feel that they have no control over and do not understand the technical systems that surround them.

https://www.iso.org/obp/ui/#iso:std:iso:19011:ed-3:v1:en

ISO 19011:2018(en) Guidelines for auditing management systems.

https://www.acm.org/binaries/content/assets/public-policy/2017_usacm_statement_algorithms.pdf

Statement on Algorithmic Transparency and Accountability, Association for Computing Machinery, US Public Policy Council (USACM), January 12, 2017.

[8] Cognitive Competence

https://www.theguardian.com/news/2018/may/01/why-replacing-politicians-with-experts-is-a-reckless-idea

Why replacing politicians with experts is a reckless idea Tue 1 May 2018

In the age of Trump and Brexit, some people say that democracy is fatally flawed and we should be ruled by 'those who know best'. Here's why that's not very clever. By David Runciman

Democracy is tired, vindictive, self-deceiving, paranoid, clumsy and frequently ineffectual. … So why don't we replace it with something better? There is a far more dogmatic alternative, which has its roots in the 19th century. … Respect the experts instead! This is the truly radical option. So should we try it?...

https://journals.sagepub.com/doi/full/10.1177/1478929917750311

Heuristics and Political Elites' Judgment and Decision-Making Barbara Vis

Political Studies Review, Published February 1, 2018

Abstract It is broadly assumed that political elites (e.g. party leaders) regularly rely on heuristics in their judgments or decision-making. In this article, I aim to bring together and discuss the scattered literature on this topic. To address the current conceptual unclarity, I discuss two traditions on heuristics: the heuristics and biases (H&B) tradition pioneered by Kahneman and Tversky and the fast and frugal heuristics (F&F) tradition pioneered by Gigerenzer et al. I propose to concentrate on two well-defined heuristics from the H&B tradition—availability and representativeness—to empirically assess when political elites rely on heuristics and thereby understand better their judgments and decisions. My review of existing studies supports the notion that political elites use the availability heuristic and possibly the representativeness one for making complex decisions under uncertainty. It also reveals that besides this, we still know relatively little about when political elites use which heuristic and with what effect(s). …

https://www.isaca.org/resources/isaca-journal/issues/2017/volume-5/key-competencies-of-the-effective-governance-professional

Key Competencies of the Effective Governance Professional Author: Noman Sultan, Ph.D., CISM, CGEIT, CITP. ISACA JOURNAL Date Published: 15 September 2017

Over the last 20 years, organizations have realized that they need to effectively manage and retain high-quality employees in order to be successful. It is extremely important that organizations invest in their leadership capabilities because leaders play an integral role in motivating, inspiring and influencing talent management. One leadership expert defines leadership as "the process of social influence, which maximizes the efforts of others, towards the achievement of a goal." Leadership is a process that can be taught through developmental experiences. Although individual differences in effective leaders are important, there is substantial evidence to show that effective leadership is a process and individuals need to acquire certain important skills to maximize their ability. Who are the next generation governance leaders (NGGLs) and what are the core attributes that distinguish them? In global academia and the corporate world, who are the NGGLs? Is it those who are powerful, extroverted or charismatic? Is it those who are humble, yet capable leaders? There are thousands of definitions, concepts and leadership tools available in the form of research, books and articles. This article recommends several strategies that NGGLs can use to be effective in governance. It draws on several years of collaborative research with many institutions.4 It also argues that leadership is a holistic process and that there are five essential ingredients that create a successful NGGL.

https://journals.sagepub.com/doi/abs/10.1177/1065912916662357

Cognitive Ability Rivals the Effect of Political Sophistication on Ideological Voting Stig Hebbelstrup Rye Rasmussen Political Research Quarterly, Published August 10, 2016 https://doi.org/10.1177/1065912916662357

Abstract This article examines the impact of cognitive ability on ideological voting. We find, using a U.S. sample and a Danish sample, that the effect of cognitive ability rivals the effect of the traditionally strongest predictor of ideological voting, political sophis-

tication. Furthermore, the results are consistent with the effect of cognitive ability being partly mediated by political sophistication. Much of the effect of cognitive ability remains, however, and is not explained by differences in education or openness to experience either. The implications of these results for democratic theory are discussed.

https://www.emerald.com/insight/content/doi/10.1108/CMS-07-2013-0125/full/html

Institutional influence, cognition and competence of top managers and innovative firms: The case of Chinese power equipment firms Kaidong Feng, Qunhong Shen, Shuming Zhao

Chinese Management Studies ISSN: 1750-614X Article publication date: 1 April 2014.

Abstract Purpose This paper aims to explore the relationship between the role of entrepreneurs and the innovation investment propensity of Chinese firms. This study is expected to enhance our understanding about the competence building of top management team for innovative development. Originality/value This paper establishes a nexus of "institutional influence-cognition-resource allocation". Such a nexus highlights the role of cognition of top managers in influencing the strategy-making of firms. So it helps in explaining the conditions for competence building in firms.

https://www.hks.harvard.edu/publications/individual-differences-need-cognition-and-decision-making-competence-among-leaders

Individual Differences in Need for Cognition and Decision-Making Competence among Leaders Jennifer Lerner, Thornton Bradshaw Professor of Public Policy, Decision Science, and Management, HARVARD Kennedy School.

Personality and Individual Differences, Vol. 51, Issue 3, Pages 274-278, August 2011.

Abstract When making decisions, people sometimes deviate from normative standards. While such deviations may appear to be alarmingly common, examining individual differences may reveal a more nuanced picture. Specifically, the personality factor of need for cognition (i.e., the extent to which people engage in and enjoy effortful cognitive activities; Cacioppo and Petty, 1982) may moderate decision makers' susceptibility to bias, as could personality factors associated with being a leader. As part of a large-scale assessment of high-level leaders, participants completed a battery of decision-making competence and personality scales. Leaders who scored higher on need for cognition performed better on two of four components of a decision-making competence measure: framing and honoring sunk costs. In addition, the leader sample performed better than published controls. Thus, both individual differences in need for cognition and leadership experience moderate susceptibility to decision biases. Implications for broader theories of individual differences and bias are discussed.

https://pubmed.ncbi.nlm.nih.gov/17068922/

Cognitive competence as a positive youth development construct: conceptual bases and implications for curriculum development

Rachel C F Sun, Eadaoin K P Hui Int J Adolesc Med Health. Jul-Sep 2006;18(3):401-8.

Cognitive competence refers to the cognitive processes that comprise (i) creative thinking, which includes various creative thinking styles, such as legislative, global, and local thinking styles; and (ii) critical thinking, which includes reasoning, making inferences, self-reflection, and coordination of multiple views.

https://academic.oup.com/cje/article-abstract/28/4/505/1698062

Governance and competence: how can they be combined? Bart Nooteboom

Cambridge Journal of Economics, Volume 28, Issue 4, July 2004, Pages 505-525, https://doi.org/10.1093/cje/28.4.505

Abstract Transaction cost economics faces serious problems concerning the way it deals, or fails to deal, with bounded rationality, the efficiency of outcomes, trust, innovation, learning and the nature of knowledge. The competence view yields an alternative perspective on the purpose and boundaries of the firm. However, the competence view cannot ignore issues of governance and, in spite of serious criticism, transaction cost economics yields some useful concepts to deal with them. This paper aims to contribute to the development of theory and empirical research that connects

governance and competence perspectives.

https://www.sciencedirect.com/topics/computer-science/cognitive-competency

Cognitive Competency Evolutionary Theory and Education.

Cognitive Work Analysis Penelope M. Sanderson, in HCI Models, Theories, and Frameworks, 2003. Control Task Analysis (CTA) defines what needs to be done for a work domain to be effectively controlled. As Vicente notes, "a control task analysis should identify what needs to be done, independently of how or by whom, using a constraint-based approach" (Vicente, 1999, p 183). Control tasks might be completed by automation or intelligent agents just as readily as by humans.

https://www.jstor.org/stable/3792365

Cognitive Skills as Predictor of Attitudes toward Political Conflict: A Study of Polish Politicians Agnieszka Golec

Political Psychology, Vol. 23, No. 4 (Dec., 2002), pp. 731-757 (27 pages) https://www.jstor.org/stable/3792365

Abstract The relationship between cognitive development and attitudes toward a current political conflict was examined in a sample of 46 Polish politicians. This relationship was examined in a control group in a neutral condition and in an experimental group after participants were presented with a hostile attack on their position on the conflict. Politicians with less advanced cognitive skills tended to use competitive attitudes in both conditions. In contrast, those who possessed more advanced skills tended to use cooperative attitudes in the neutral situation; after the emotional attack, they tended to avoid further involvement in the conflict and sought to exit it. The key difference in participants' cognitive functioning was their ability to differentiate perspectives and to transcend their own point of view in the conflict.

https://www.jstor.org/stable/259138

Cognition and Corporate Governance: Understanding Boards of Directors as Strategic Decision-Making Groups Daniel P. Forbes and Frances J. Milliken

The Academy of Management Review, Vol. 24, No. 3 (Jul., 1999), pp. 489-505 (17 pages) https://doi.org/10.2307/259138

Abstract Recent research developments underscore the need for research on the processes that link board demography with firm performance. In this article we develop a model of board processes by integrating the literature on boards of directors with the literature on group dynamics and workgroup effectiveness. The resulting model illuminates the complexity of board dynamics and paves the way for future empirical research that expands and refines our understanding of what makes boards effective.

Disclaimer

Where doubt is cast in this article on the intellectual capability, algorithmic expertise or cognitive competence of politicians, this is not meant to be insulting or offensive to any particular person, politician, Party, Member of Parliament, Elected Representative, Government Minister, or Policy, past or present; nor are any digitally disruptive ideas set forth herein intended to promote or encourage social unrest, sedition, or insurrection.

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