The DAKSH Centre of Excellence for Law and Technology at IIT-Delhi (DCoE) was established in October 2020 as a collaboration between Indian Institute of Technology (IIT) Delhi and DAKSH Society, Bengaluru to:

- solve problems of the law and justice system, and create new knowledge, by using methods, tools, and techniques from various disciplines;
- build models and tools for application in the law and justice system; and
- build a community of practice that will bring together members of the judiciary, civil servants, legal practitioners, researchers across disciplines, and industry.

As an interdisciplinary centre, the CoE seeks to leverage rigorous and interdisciplinary research to produce real-world impact in the functioning of the justice system.

The CoE is happy to announce its Call for Project Proposals, 2021 for the faculty and students of Indian Institute of Technology, Delhi. All details about the call for proposals are available here.

How to apply?
Proposals must be emailed at coordlawtech@iitd.ac.in in the format given in the proposal submission template along with relevant supporting material.

Timelines and process
- Announcement**: 4ᵗʰ March**
- Workshop by DAKSH: 12ᵗʰ March
- Last date for submission of proposals are **25ᵗʰ March 2021 before 23:59 hours IST.**
- Preliminary evaluation by expert committee: 9ᵗʰ April
- Confirmation of shortlisted proposals: 12ᵗʰ April
- Presentation to experts committee by shortlisted teams by: Between 15ᵗʰ April – 22ⁿᵈ April
- Announcing of final grantees: **5th May 2021**

Evaluation
Proposals will be assessed by an expert committee composed of members from IIT-Delhi & DAKSH. Some of the factors based on which the proposals would be evaluated are:

- Inter-disciplinary component
- Impact on furthering the boundaries of knowledge or functioning of the justice system.
- Novelty, Originality, and Feasibility.
- Expertise of Principal Investigators and Co-Investigators in the proposed area.

Keeping in mind the impact focus of the CoE, these projects are expected to be carried out in close consultation with practitioners and experts through participation in meetings, events, and periodic publications of blog posts, articles, and opinion pieces apart from the publication of research papers in peer reviewed journals.

It is expected that data used for the research and the results of the research, will be made available in the public domain as public goods, unless there are other compelling reasons that the research team informs the CoE.

Knowledge Partner

DAKSH has been working on justice system reforms since 2015 using pioneering empirical and data-based methods from a systemic change perspective. It has a deep understanding of institutions, processes, and

data in the justice system, and its interaction with other critical stakeholders such as legal practitioners, litigants, and citizens. For more information, please visit: https://dakshindia.org/ .

DAKSH will be the legal knowledge partner for these projects.

DAKSH will be conducting a workshop on 11th March for the faculty and students of the Indian Institute of Technology, Delhi on law and justice system reforms. Clarifications can also be sought during this workshop.

Applicants with any further specific questions about how DAKSH can assist can reach out to Surya Prakash B.S., Programme Director, DAKSH at surya@dakshindia.org after the workshop.

Judicial Data
Sources of data that can be used for the projects:

- eCourts (trial courts): https://districts.ecourts.gov.in/
  Contains information regarding courts across the country, provides data related to cases, hearings, causelists (cases listed for hearing on a day), as well as orders and judgments.
- eCourts (High Courts): https://ecourts.gov.in/ecourts_home/static/highcourts.php
  Contains links to various High Court websites where information can be found regarding each High Court, the judges, cases and hearings, causelists, display boards, orders, and judgments.
- National Judicial Data Grid (NJDG) (district courts):
  https://njdg.ecourts.gov.in/njdgnew/index.php
  Provides summary statistics regarding cases that are disposed and currently pending in the trial courts.
- NJDG (High Courts): https://njdg.ecourts.gov.in/hcnjdgnew/
  Provides summary statistics regarding cases that are disposed and currently pending in the High Courts.
- Supreme Court: https://www.sci.gov.in/
  Contains information regarding the Supreme Court, the judges, cases and hearings, causelists, display board, orders, judgments, as well as quarterly and annual reports containing summary data of High Courts and district courts across the country.
- Department of Justice: https://doj.gov.in/
  Contains information regarding the names of judges in the Supreme Court and High Courts along with information such as the date of their appointment and retirement, as well as court vacancies.
- DAKSH database: https://dakshindia.org/login-to-database/
  Contains district court data (regarding cases and hearings) in an analysable format for courts in 174 districts.
- Development Data Lab: http://www.devdatalab.org/judicial-bias-data
  Contains district courts data (regarding cases) and data regarding judges for all trial courts across the country from 2010-2018.
- National Prisons Information Portal: https://eprisons.nic.in/public/Home.aspx
  Contains summary statistics on prisons across India, the number of inmates, new admissions, releases, and visits.
- National Crime Records Bureau (NCRB): https://ncrb.gov.in/
  Contains annual reports on crimes in India and prisons statistics

Topics for proposals

Expected duration for all proposals: 1-3 years.

A. Modelling the justice system

There are many uses of a mathematical model of the justice system and how its subsystems interact with each other. Mathematical modelling can serve as a powerful tool for understanding and predicting the behaviour of these systems under different scenarios. Such models can be used by policy makers and leaders to make more informed decisions. It would help in prioritising and sequencing interventions. It is possible to answer questions as varied as 'How would listing lesser number of cases per day impact pendency of cases' to "How will decriminalisation of cheque bounce cases impact the judiciary'.

New approaches drawn from the domains of systems dynamics and complex adaptive systems are most relevant for the law and justice system. It is understood that developing models are an iterative process over a period of time.

This project would involve:
- ❏ mapping the justice system,
- ❏ mapping information flows within the system,
- ❏ learning from work done in this area in other countries and other domains,
- ❏ fitting the information flows into mathematical models,
- ❏ experimenting with a few models, and
- ❏ validating results - both historical and simulated.

Expected outputs would be:
- ❏ interactive simulation models; and
- ❏ research papers in peer reviewed journals.

B. Tool to make laws more accessible to citizens, and case duration & outcome predictor

The difficulty of understanding the judicial process is daunting for citizens seeking to resolve disputes. Laws in India are well known to be complex and difficult, if not impossible, to navigate for citizens. This is complicated by India's common law jurisprudence, where judicial precedent is followed in subsequent decisions.

A tool that would help citizens to apply the complex web of laws to specific everyday circumstances could have a significant impact on the lives of citizens. Citizens would benefit greatly from being able to understand what options they have to seek relief in courts, at the very least for common disputes which are simple in terms of the legal questions they raise, such as money claims or cheque bounce cases. The tool would also show up conflicts and contradictions in law, overlaps in regulation, and possibilities for simplification. The building of the tool can also be a prototype for the foundational structure required to make laws comprehensible by computers.

Creating such a tool requires the union of many disciplinary approaches, as it would essentially need to be capable of applying law to facts, via algorithms. Both legal understanding and technical knowledge would be necessary to achieve this. Once challenge is to be able to represent legislation, and possibly case law, in

the 'formalism of a programming language'.[1]   The former is known to be possible, and expert systems have been developed since the 1980s to be able to guide citizens through a narrow area of law, and have been applied in systems that aid legal services for tax compliance. Expert systems guiding citizens to courses of action and helping them choose templates for letters and documents already exist, such as in the Civil Resolution Tribunal in the province of British Columbia in Canada.[2]

Recent advances in machine learning have shown that algorithms are capable of applying facts to predict outcomes of cases.[3] This suggests that if the capability of algorithms to discern facts is coupled with their ability to interpret laws, it may be possible to develop a tool that can determine which laws apply to a given set of facts, and accordingly advise citizens on their options.

The amount of time that a case is likely to take to be resolved in court often determines whether a party is willing to approach the judiciary for dispute resolution and rights redressal. While the judiciary has taken steps to make available data regarding the progress of cases, there exist limitations with the data currently available that restrict one's ability to predict how long a particular case is likely to take to be resolved. The duration a case may take to be resolved depends on a variety of factors such as the facts and subject matter of the dispute, the legal issues, the number of witnesses, the nature of evidence, etc. However, much of this information is only available in court orders/ judgments and not as structured data. Many documents such as judgments and orders digitised as PDF images, not as text. The limitation in being able to manually read several court orders/ judgments, classify them for analysis, and then accurately predict case durations is where the problem lies. Therefore, a tool which predicts case timelines and outcomes will need to be able to identify and classify parts of legal documents and discern relevant laws and facts from them without the benefit of marked up or classified text. If the tool is to benefit from the full volume of data available, it would need to be able to classify information from all official languages, and therefore language experts are required to determine linguistic equivalence of relevant legal concepts.

Empowering citizens with accurate information to be able to make an informed decision is vital. In addition to technical and legal expertise, it would also need research from social scientists to understand citizens' needs. As this project is intended to address the role of information in providing access to justice, it is necessary to first gain an understanding of how variation in geographic region, socio-economic conditions including income, urbanisation and access to internet/mobile internet, language, and other factors may affect the nature of information citizens may need from such a tool. Interface design and software development must be done accounting for these varied needs.

This project will therefore involve:

- ❏ Engaging with citizens to understand the nature and extent of information sought.
- ❏ Development of the models and systems to analyse disputes based on facts provided by citizens and determine the applicable laws, and predict durations and outcomes. This includes the acquisition of data
- ❏ Analysis of structured and unstructured data from the judiciary, understanding the drivers for delay, evaluating whether any change in the nature of a case can alter the duration of time it is likely to take, and building and testing a model to predict case duration and outcome.
- ❏ Testing and validation of the models

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[1] Richard E. Susskind, 2019, Online courts and the future of justice. Oxford University Press, p.160

[2] Civil Resolution Tribunal (British Columbia, Canada), 2016, 'Solution Explorer Tool'. Civil Resolution Tribunal, available at https://civilresolutionbc.ca/how-the-crt-works/getting-started

[3] Nikolaos Aletras, Dimitrios Tsarapatsanis, Daniel Preoţiuc-Pietro, and Vasileios Lampos. 2016. "Predicting judicial decisions of the European Court of Human Rights: A natural language processing perspective." PeerJ Computer Science 2: e93.

❏ Design and development of interfaces
❏ Undertaking an exercise that can assist citizens in understanding the likely duration of time their case will take to be resolved by the courts and the range of likely outcomes. Trials can be conducted to evaluate citizens' satisfaction with the tool in this stage.
❏ Revise and re-test tools as per feedback

Expected outputs:
❏ Models that can determine the justiciability and subject matter of a dispute and predict likely outcomes and timelines based on facts submitted by citizens lacking in legal expertise
❏ Designed tools that can apply these models to provide citizens with information and insights, with proven satisfactory performance
❏ Documentation of both of the above to enable further development of intelligent citizen-facing tools

C. Case Flow Management

The Supreme Court in the case of Salem Advocate Bar Association v. Union of India introduced the concept of Case Flow Management (CFM)– a concept that lies at the core of effectively managing the workload of a court. Based on the recommendations of the committee headed by Justice M. Jagannadha Rao, the Court in this case urged the High Courts to adopt the Model Case Flow Management Rules for High Courts and subordinate courts, with or without modifications, so as to ensure fair, speedy, and inexpensive justice.

The key features of CFM rules are:
(a) classification of cases into 'tracks' based on their subject matter and nature of litigants. Timelines are prescribed for disposal for each track - these timelines vary from 9 months to 2 years;
(b) laying down guidelines and timelines for stage-wise progress;
(c) prescribing a separation of tasks and roles responsible for carrying them out.

Most of the high courts have enacted CFM rules in adherence with these directions. These rules are not followed in practice. See here:
 https://dakshindia.org/case-flow-management-rules-in-india/ .

There is a need to revisit the Model Case Flow Management Rules to scientifically assess case progress, prescribe a methodology for determining practicable timelines, and stipulate how case flow can be managed to ensure adherence to timelines. This will involve understanding the litigation process, analysing available data and orders/judgments, engaging with domain experts and stakeholders through consultations to ascertain feasibility of models and setting benchmarks for disposal.

Research should consider the importance of understanding that CFM in India will have to be tailored for the needs of different states, and within the states as there may be stark differences in pendency and resource allocation. The study needs to have a holistic approach in terms of understanding the budgetary, human resource availability and infrastructure viability in different states.

An impediment to enforcing CFM is also awareness and understanding within the legal community about using the CFM rules. In many jurisdictions, where CFM was initiated, there was resistance to the initiation of CFM and this caused severe impediments to the initiation of CFM. This is primarily due to the fact that CFM is not just a legal change, it is in fact a behavioural change as legal professionals and judges will have to start adhering to time management mechanisms for their cases. This calls for studying organizational and management aspects that will allow for CFM changes in the Indian legal system. The behavioral aspect is an important one as the enforceability of CFM relies on organisational and behavioral changes of all the stakeholders in the justice system.

Adoption of case flow management practices in India can be said to have the following dimensions:

1. Conceptual: What would the conceptual framework of a CFM specific to India (and sub-national jurisdictions) be? What is the hierarchy of objectives of CFM? What are the learnings from global experience in this regard?
2. Informational: What are the specific informational needs of stakeholders for CFM to meet its objectives? How can informational asymmetries be balanced? What are the constraints in this regard? How can they be overcome?
3. Technological: What tools are required for CFM to meet its objectives? How would such tools function?
4. Behavioural: What behavioural aspects and incentives of stakeholders need to be factored in while designing CFM for India?
5. Institutional: What institutional changes specific to India, in what sequence, are required for CFM to be implemented? What are the learnings from global experience to undertake this transition?

D. Scientific scheduling of cases & work allocation for judges

The pendency problem in Indian courts is inextricably linked to poor administration and management of hearings. Currently, courts manually schedule cases creating various inefficiencies in the system such as corruption, mismanagement, unequal distribution of workload, and an increase in the backlog of cases. In most courts, the practice of listing cases is handled either by the court staff or judges themselves. Some judges in district courts are allocated as many as 200 cases a day. This work allocation system leads to several ineffective hearings where either the case is not heard and merely adjourned, or no significant progress takes place due to paucity of time. At the district-level, the Principal District Judge (PDJ) allocates work between district court judges following norms/practices followed in that jurisdiction. There exist no set rules as to how cases should be allocated between different judges. While some judges are dedicated to specific subject matters (special courts), and criminal cases are allotted based on the police stations from which they are filed (judges are allotted specific police stations). New civil cases and the allocation of cases for special courts are left to the discretion of the PDJ.

A large number of ineffective hearings is a waste of time and resources for the judiciary and lawyers and leads to lack of trust in the certainty of hearings and perpetuates a culture of seeking adjournments. Judicial attention is a scarce resource within the court system, and thus it needs to be allocated so that the system efficiently utilises this resource. Scientific scheduling of cases is one way of achieving this. The concept of scientific scheduling is not a novel one. As far back as 1980, the Ninth Circuit Court of Appeals in the US used a software known as Calen9. This software allocated cases according to the cases' estimated degree of difficulty, the length of time the appeal has been pending, and the case type; and secondarily, according to the district court from which the appeal was taken. Scientific scheduling has been used to increase the effectiveness of other complex systems such as in manufacturing[4], healthcare[5] and logistics[6] [3]. These models can be used and customised to the needs of the Indian judiciary.

A lopsided allocation of the workload with some judges having a higher number of cases than others can lead to unequal pressures on judges and greater delays in specific courts. Further, workload allocation can also have other effects such as judge evaluations, e.g., a judge who gets allotted simple matters may be able to dispose of more of them than a judge who receives complex matters and may therefore be seen as more efficient in his work. It is also important to ensure equal access to citizens regardless of which court their

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[4] Hsieh, F. S., & Lin, J. B. (2014). A dynamic scheme for scheduling complex tasks in manufacturing systems based on collaboration of agents. *Applied Intelligence*, *41*(2), 366-382

[5] Brandenburg, L., Gabow, P., Steele, G., Toussaint, J., & Tyson, B. J. (2015). Innovation and best practices in health care scheduling. *NAM Perspectives*.

[6] Nouiri, M., Bekrar, A., & Trentesaux, D. (2020). An energy-efficient scheduling and rescheduling method for production and logistics systems. *International Journal of Production Research*, *58*(11), 3263-3283.

case has been assigned to. For this purpose, an exercise must be undertaken to create a system to allocate workload between judges scientifically. This will involve understanding existing practices in workload allocation, what factors can and must be considered in such allocation, how the existing system can be tweaked to consider such factors and auto-allocate cases, and test such a program in a pilot court.

To this end, it is important to devise a system whereby cases can be scientifically listed that can consider the subject matter of cases, their urgency, their age, their stage, and the time the hearing is likely to require. This will involve undertaking efforts to record the time taken for hearings, identifying the subject matter of cases and the time that is taken for their resolution, understanding the litigation process and stages in a case, and building and testing a model to scientifically list and schedule future hearings for a judge given an understanding of his entire docket. An important outcome of this project will be a measure of certainty in the day-to-day progress of cases in court, which will increase the citizens' trust in the judicial system.