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Japan's Digital Legislative Roadmap and Automated Governance: Progress, Challenges, and Prospects

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I.   Introduction[1]

In recent years, the global push for digital transformation has been reshaping the landscape of public governance.   Governments worldwide are increasingly adopting digital tools, automated processes, and data-driven decision-making to enhance efficiency, transparency, and accessibility.   Amid this global shift, Japan has also been pursuing the digitalization of its legislative processes—referred to as digital legislation—and exploring the potential for automation within public administration.   This includes efforts to create interconnected legal data, improve machine-readability of laws, and leverage technologies like natural language processing to support legislative drafting and reform.   The purpose of this column is to introduce Japan's ongoing efforts in digital legislation and governance automation.   It will examine the frameworks being developed, the opportunities these initiatives create, and the challenges that remain in achieving seamless digital governance.

II.   Japan's Digital Legal Roadmap

1.   Overview of the Proposed Approach

Japan's Digital Agency conducted research and pilot studies on the digitalization of legislative affairs and the development and utilization of legal data, culminating in the publication of a report titled **"Research and Study on the Current Status and Future of Digital**

Legislation" in May 2024.[2]   In this report, it was noted that The Digitalization Team for Legislative Affairs under Japan's Provisional Administrative Digitalization Council Working Group proposed the Digital Legislative Roadmap as a systematic framework to advance the digitalization of rulemaking and decision-making processes.[3]   This roadmap outlines a long-term vision aimed at fostering the creation of advanced services through legal technology (LegalTech), enabling flexible and effective system design and achieving fair and efficient administrative operations.[4]

The roadmap is divided into phased approaches, each building on technological development and data integration:

1. **Phase 0**: **Current State**

   The current process depends on meticulous manual work during the drafting stage. Additionally, machine-readable data is not yet available for regulatory documents, such as notifications and subordinate regulations that govern much of the operational framework, or for historical data needed for analyzing past regulatory structures.[5]

2. **Phase 1**: **Introduction of Reliable Machine-Readable Legislative Data**

   Reliable, up-to-date legislative provisions (above the level of notifications) are published in XML formats or through legislative search pages upon promulgation. Certain historical data is also made accessible, enabling users to retrieve past provisions.   Additionally, cross-referencing of specific sections is facilitated through unique identifiers, ensuring seamless and precise access to interconnected legal information.[6]

3. **Phase 2**: **Linking Legal Documents and Enabling Dependency Analysis and Real- Time Updates**

   In addition to statutory laws, legal documents such as notifications, public comments, and article-by-article explanations, become accessible as machine-readable data. Building on this foundation, reliable connected data for statutes is established,

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[2] The Digital Agency's release, available at https://www.digital.go.jp/councils/administrative-research-wg/LSMfoLzU

[3] Document from the 8th Meeting of the Digital Provisional Administrative Council Working Group, at p. 6.

[4] "Research and Study on the Current Status and Future of Digital Legislation" dated March 29, 2024, and available on the Digital Agency's website at https://www.digital.go.jp/policies/legal-practice

The report also outlines the findings as to initiatives abroad aimed at advancing the digitalization of legislative affairs.   Specifically, it describes projects such as Better Rules - Better Outcomes in New Zealand, DataLex in Australia, the Rules as Code Discovery Project in Canada, Legislation Editing Open Software in the EU, E-Gesetzgebung in Germany, Lex Dania in Denmark, and the Center for Computational Law (CCLAW) in Singapore.

[5] *Id.*, at p.8.

[6] *Id.*, at p.8.

detailing dependency and delegation relationships.[7]

4. **Phase 3**: **Integration of Semantic Analysis and Natural Language Processing Tools**

   Advanced analysis capabilities extend beyond simple keyword searches, enabling abstract relevance-based assessments.   This allows for the automated prediction of regulatory presence and applicability.   For example, analog-based regulations can be identified with minimal human intervention, marking a significant step toward automated regulatory analysis and compliance prediction.[8]

5. **Phase 4: Development of Logical Structure Analysis and Simulation Capabilities**

   Technologies are established to analyze the logical structures underlying the application of laws and convert them into machine-readable formats.   Based on the creation of a reliable database linking the structural framework of laws to their implementation and operational systems, static simulations of legislative structures become possible.[9]

6. **Phase 5**: **Simulation of Laws' Structural and Social Impacts Through Advanced AI Models and Digital Twins**

   Laws are encoded in machine-executable formats, incorporating semantic content, enabling advanced simulation technologies in virtual environments. This development facilitates dynamic structural simulations of laws, providing insights into their practical and social impacts within a controlled, virtual setting.[10]

2. Leveraging Technology for Rulemaking

The proposed framework emphasizes advanced technologies to modernize legislative workflows and improve administrative processes:

- **Natural Language Processing (NLP)**: Applied to analyze legislative text, identify logical inconsistencies, and extract relationships among statutes.[11]

- **Simulation Technologies**: Digital twins simulate the impact of legislative changes in a virtual environment, facilitating policy experimentation and optimization.[12]

- **AI Integration**: Machine learning models predict policy outcomes and automate document processing, enhancing efficiency without compromising legal integrity.[13]

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[7] *Id.*, at p.8-9.
[8] *Id.*, at p.8-9.
[9] *Id.*, at p.9.
[10] *Id.*, at p.9.
[11] *Id.*, at p.12-15.
[12] *Id.*, at p.29.
[13] *Id.*, at p.16.

III. Key Challenges for Japan

1. Data Infrastructure and Accessibility

One of the most pressing challenges for Japan in its pursuit of digital legislative transformation and governance automation is the state of its legal data infrastructure.

First, to facilitate automation and advanced technologies such as NLP, legal documents must be structured in machine-readable formats. Currently, many documents are not standardized for digital processing, which impedes efforts to create interconnected and interoperable legal data systems.

Second, legal notifications, guidelines, and legislative intent documents are often stored in silos across different ministries and agencies. This decentralization may lead to inconsistencies in data management and difficulties in achieving uniform standards for integration.

Third, transitioning from legacy paper-based or fragmented digital systems to centralized, interoperable platforms presents both technical and organizational challenges. This process requires significant investment in infrastructure and the creation of protocols for seamless data accessibility across government bodies.

2. Human and Technological Balance

Maintaining an appropriate balance between automation and human judgment is another critical challenge as Japan advances its digital governance agenda.

- **Balancing Automation with Oversight**:

  While automation can streamline decision-making, critical decisions—particularly those involving individual rights or legal interpretations—must be subject to human oversight. Ensuring that automated systems are explainable and reviewable by human officials is essential to maintaining public trust. Further, while automation excels at handling routine, repetitive tasks, it is prone to errors in cases requiring contextual understanding or nuanced judgment. For sensitive areas like legal interpretations, policy decisions, and dispute resolution, human judgment must remain central. Japan must carefully evaluate where automation adds value and where it risks introducing inefficiencies.

- **Addressing Transparency Concerns**:

  If citizens cannot understand or challenge decisions made by algorithms, it could

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undermine confidence in governance and raise questions about fairness and due process. Japan must prioritize transparency by clearly communicating how automated decisions are made and how accountability mechanisms function. Further, adapting to new technologies requires training government officials to work effectively with automated systems. Ensuring that public servants are equipped with the skills to interpret, manage, and oversee automation will be key to successful implementation.

IV.   Prospects and Future Directions

1.   Next Steps for Japan's Digital Legislation

Japan's Digital Legislative Roadmap lays a certain foundation for digital legislation, but further steps are required to ensure its success. A critical focus for Japan's next phase is improving machine-learning technologies, particularly for legal text interpretation and legislative drafting.[14] NLP tools can support accurate legal analysis, automate routine drafting processes, and suggest legislative revisions by identifying inconsistencies or outdated provisions in existing laws.

2.   Implications for Local Governments

The digital transformation of legislation is not only relevant at the national level but also holds significant implications for local governance. Digital legislative tools can assist local governments in updating ordinances, ensuring compliance with national laws, and managing amendments efficiently. Local authorities, which often face resource constraints, stand to benefit from automation tools that streamline ordinance drafting, revision tracking, and legal impact analysis.

V.   Conclusion

The Digital Legislative Roadmap marks an important step toward modernizing governance through digital transformation. With the proposed approach, Japan has laid the groundwork for data-driven legislative processes, automation of routine tasks, and the future use of advanced technologies like NLP and digital twins for policy simulation. While these developments indicate progress, challenges still exist. Integrating fragmented legal data, ensuring transparency and accessibility, and balancing automation with human judgment are

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[14] In this context, the Digital Agency will host the "Legislation × Digital" Hackathon, a team-based competition to develop services that combine the fields of legislation and digital technology, from February 5 to March 6, 2025.
https://www.digital.go.jp/news/0ac7897f-acd6-47c6-a579-48339d4805e0

critical hurdles that require ongoing attention.   A robust legal and ethical framework must also accompany this transformation to ensure that automation enhances, rather than undermines, public trust and legal integrity.

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