Compliance and software transparency for legal machines

Vytautas ČYRAS
Vilnius University
Vytautas.Cyras@mif.vu.lt

Friedrich LACHMAYER
Vienna
University of Innsbruck
www.legalvisualization.com

Tallinn, 8-11.06. 2014
1. **Legal machines**
   - E-proceedings via forms in the Internet
     * E.g. tax declarations
   - Making the architecture transparent

2. Defining **compliance**
   - *e-services* are in the background
   - Each *artefact* can cause harm, e.g.:
     * *Message* can cause hart attack
     * *Pencil* can serve as a murder tool

3. The concept of **subsumption**
1. Legal machines
Machines produce legal acts

- Actions with *legal importance* and *legal consequences*
- *Institutional facts*

1) Actor
   - or
   - human being
   - machine

Examples:
- vending machines
- traffic lights
- computers in organisations
- workflows

2) Actor → Action → Actor
Factual acts (raw facts)

‘Alice puts coins in her piggy bank’
Legal acts: *impositio*

‘**Chris** puts coins in the ticket machine’

‘**Policeman** raises hand’

- **Legal condition**
- **Legal actor**
  - human being
  - machine
- **Legal action**
- **Legal effect**

*Institutional facts* and *legal institutions* (McCormick & Weinberger 1992)
2. Legal machines and transparency
Machines are not flexible

- You can argue with an operator
- You cannot argue with a machine
  - E.g. “credit card declined”

- You can violate legal rules
- You cannot violate technical rules
Changeover

Text culture  Machine culture
Technical changeover ‘legal text’ → ‘program’

General Norm
- Law
- Decree
  Published

Legal machine program
No access

Text culture  ←  Machine culture
Technical changeover ‘legal text’ → ‘program’

General Norm
- Law
- Decree

Published

Legal machine program
No access

Legal machine
- Ticket machine
- Form proceedings

→ Problems
1. Transparency

- General Norm
  - Law
  - Decree
  - Published

- Individual Norm
  - Court judgement
  - Administrative decision

Party

Text culture

2. Ex-post legal protection

- These 2 means were not from the beginning.
- They were trained in the course of time, but now come as a standard.
1. Transparency

General Norm
- Law
- Decree

Published

2. Ex-post legal protection

Individual Norm
- Court judgement
- Administrative decision

- However, these 2 standards are missing in the beginning of machine culture.

Technical changeover ‘legal text’→ ‘program’

Legal machine program
No access

Text culture ➔ Machine culture
• These 2 standards are missing in the beginning of machine culture.

• Therefore we address them.
**Requirement 1:**
The architecture of software should be available

**Requirement 2:**
Software should provide a trained, effective and rapid legal protection

Example 1. The law provides 10 variations but the program contains only 9.

Example 2. A ticket machine gives no money back. This makes a problem for customers expecting change from banknotes.
Goal

Equal standard of transparency and legal protection in text culture and machine culture
1. **Transparency**

   **General Norm**
   - Law
   - Decree
   Published

   **Individual Norm**
   - Court judgement
   - Administrative decision

2. **Ex-post legal protection**

   **Legal machine program**
   - No access

   **Legal machine**
   - Ticket machine
   - Form proceedings

---

**Text culture** -> **Machine culture**

**Technical transformation ‘legal text’ → ‘program’**

1. Lack of transparency

2. No ex-ante legal protection
3. Compliance
Given an IT system $S$ and an externally imposed set $R$ of (legal) requirements.
1. Make $S$ comply with $R$
2. Provide assurance that auditor will accept as evidence of the compliance of $S$ with $R$

1. Formalise $R$
2. Identify which sub-systems of $S$ are affected by $R$
3. Determine what assurance has to be provided to show that $S$ is compliant with $R$
4. Modify $S$ to become compliant with $R$ and to provide the necessary assurance
Holistic view to compliance

Regulation and IT alignment framework (Bonazzi et al. 2009)
Comparison

Artificial Intelligence.
Alan Turing

- “Can machines think?”

Informatics and law.
Compliance

- “Does a software system comply with law?”

Definitions of the meaning of the terms:

- ‘machine’ and ‘think’
- ‘law’ and ‘comply’

Both questions
- are ill formulated in the sense that:
  - can’t be answered ‘yes’/‘no’
  - not a ‘decidable’/‘undecidable’ problem
- an answer depends on philosophical assumptions

Goal of AI: “enhancing rather than simulating human intelligence”
- first understand then start programming
Machine-based or machine-assisted decision making?

- Formalistic approach to the law
- Mechanistic subsumption

No!
Standard cases, hard cases, emergency cases

Standard cases – “Yes”

Hard cases – “No”

Legal machine

Emergency cases – not applicable

Legal decision
“Accept” ≠ effective consent
Noncompliant scenario

- The fictitious company, “KnowWhere” offers a “Person Locator App” which can track the user’s location who has installed the app on his smartphone.
- The app accesses the GPS of the smartphone and sends the coordinates and a Facebook ID to the server.
- KnowWhere relies on Google Maps.
- The “Person Locator Portal”
  - Shows maps with user positions and Facebook IDs
  - The server collects all user locations and uses Google Maps to highlight their positions on the map.

Legal reasoning

Question: Is the disclosure of user data to Google lawful?

Answer: No.

  – Question 1: Is permission or order by the law provided? No.
  – Question 2: Has the data subject provided consent?

    No. The users are not informed about the transfer of personal data from KnowWhere to Google. Therefore, **effective consent** is not given.

Conclusion:
Data transfer from KnowWhere to Google cannot be justified. Therefore KnowWhere violates data privacy law.
Modelling legal norms as rules

\[
\text{state_of_affairs} \rightarrow \text{legal_consequences}
\]

if \textit{condition} then effects
else sanction

\[
\begin{align*}
((\text{Collection}(X) \lor \text{Processing}(X) \lor \text{Use}(X)) \\
\quad \text{AND \ performedUpon}(X,Y) \text{ AND PersonalData}(Y)) \\
\quad \text{AND} \\
(\text{Permission}(P) \lor \text{Order}(P)) \text{ AND givenFor}(P,X))
\end{align*}
\]

\[
\text{OR}
\begin{align*}
(\text{Consent}(C) \text{ AND DataSubject}(D) \text{ AND about}(Y,D)) \\
\quad \text{AND \ gives}(D,C) \text{ AND permits}(C,X))
\end{align*}
\]

\[
\rightarrow
\begin{align*}
\text{Lawfulness}(P) \text{ AND givenFor}(P,X)
\end{align*}
\]

See also Kowalski, Sergot, etc.
4. Subsumption
Subsuming a fact to a legal term

Legal term
A:

Fact a:
Dead body

Legal term:
A

2) Normative subsumption

1) Terminological subsumption

Fact:
a

A \rightarrow B

A & C \rightarrow D

Conclusion, judgment
Difficulties inherent in law

1. Abstractness of norms. Norms are formulated (on purpose) in abstract terms

2. Principle vs. rule. The difference in regulatory philosophy between the US and other countries

3. Open texture. Hart’s example of “Vehicles are forbidden in the park”

4. The myriad of regulatory requirements. Compliance frameworks are multidimensional

5. Legal interpretation methods. The meaning of a legal text cannot be extracted from the sole text
   – grammatical interpretation,
   – systemic interpretation
   – teleological interpretation
Thank you