Technical Rules and Legal Rules in Online Virtual Worlds

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

Friedrich LACHMAYER
University of Innsbruck, Austria
Friedrich.Lachmayer@uibk.ac.at
1. Introduction
Virtual Worlds

• **Serious**, e.g. Second Life, Active Worlds Educational Universe

• **Leisure purposed** – a game
  – e.g. World of Warcraft

• I am neither proponent nor opponent of them
  – Consider negative factors such as addiction. Thus “pro” and “contra” arguments

• Research & software development project
  – **FP7 ICT VirtualLife** project, 3 years 2008-2010
  – **Title**: “Secure, Trusted and Legally Ruled Collaboration Environment in Virtual Life”
  – **Goal**: software platform, peer-to-peer architecture
  – **Scenario**: learning support, e.g. a “University Virtual Campus”
Sample scenarios

Web 2.0
• information as a content

Virtual world
• interaction as a content
Motivation of learning

- “Pro” virtual worlds
  Learning materials
    - static, searchable in 2D for learner’s queries (Web)
    - interactive objects (virtual worlds)

- “Contra” virtual worlds
  - values?
    - mono-sensorial, perceived through computer’s display
    - multi-sensorial learning in the real world
      - concurrency of human’s brain and senses (seeing, hearing, feel)
      - “learning by doing” when accomplishing real-world tasks
2. A legal framework of the VirtualLife platform
About FP7 VirtualLife project

• Novelties
  – issues of security and trust
  – in-world legal framework.

  Implemented as shrink-wrap agreements

  1. a “Supreme Constitution”
  2. a “Virtual Nation Constitution”
  3. a set of contracts

  – peer-to-peer network communication architecture
Legal framework of VirtualLife

Three tiers:

1. A “Supreme Constitution”
   - Code of Conduct
     - values, e.g. avatars integrity, sanctity of property, reputation, etc.
     - a part of EULA (End User License Agreement)
     - implemented as a **shrink-wrap** agreement. A contractual level

2. A “Virtual Nation Constitution”
   - authentication procedure to become a member of Nation
   - copyright law of a Nation, e.g. “CopyLeft” or “CopyRight”

3. A set of different sample contracts
   - sales contract
   - teacher employment contract
   - student contract
From **legal rules** – to **virtual world rules** – to **technical rules** in software

‘Keep off the grass’

Translation

Natural intelligence – a team of
• legal expert
• virtual world developer

‘The subject – avatar – is forbidden the action – walking on the grass’

Translation

Natural intelligence
• a programmer

A software program, i.e. a script.
Implemented by triggers which control the avatar

This translation complies with:
– Lawrence Lessig’s conception “Code is law”
– Raph Koster’s “Declaration of the Rights of Avatars”
Examples of rules

1. An avatar is strong opposition to touch objects not owned by him or a certain group.
2. An avatar not belonging to a given group is forbidden to a given area of the zone.
3. An avatar is forbidden to create more than a given number of objects during a given time interval.
4. An avatar is forbidden to use a given dictionary of words (slang) while chatting with other avatars.
5. An avatar of age is forbidden to chat with avatars under age.
Facing the problems of translation

- **Abstractness of norms.** Legal rules are formulated abstractly.

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

- **Legal interpretation methods.** The meaning of a legal text cannot be extracted from the sole text.
  - grammatical interpretation
  - teleological interpretation

- **Legal teleology.** The purpose of a legal rule usually can be achieved by a variety of actions.

- **Heuristics.** The ability to translate abstract high level concepts and invent low level ones.
3.
A spatialization of a virtual world
Spatialization – a virtual world as a whole

Virtual space. Frame: constitutive. ~ Theatre
Technical rules

Virtual space. Frame: constitutive. ~ Theatre

Regimes, paradigms, ethics, professional morality

Rules 1.

**Technical**

Factual limitations, e.g. to fence the grass.

---

Avatar

Stage

Avatar

Avatar

Avatar

Actions
Legal rules

Virtual space. Frame: constitutive. ~ Theatre

Rules 1. Technical
Factual limitations, e.g. to fence the grass.

Rules 2. Legal
obligations, permissions, prohibitions.

Authorities: virtual procedures, e.g. online dispute resolution
F. Lachmayer’s spatialization

Virtual space. Frame: constitutive. ~ Theatre

Regimes, paradigms, ethics, professional morality

Rules 1. Technical
Factual limitations, e.g. to fence the grass.

Rules 2. Legal
obligations, permissions, prohibitions.

Rules 3. Reputation
economic, social, civic.

Rules n. Energy

Authorities: virtual procedures, e.g. online dispute resolution

Stage
Avatar
Actions
Avatar
Avatar
An example of reputation rules

Reputation:
• economic,
• social,
• civic.
Principles of construction

Core ontology

Special ontology 1
- Rules 1. Technical

Special ontology 2
- Rules 2. Legal

Special ontology 3
- Rules 3. Reputation

... Special ontology n
- Rules n. Energy

Stage
- Avatar

Avatar
- Actions

Avatar
Principles of construction

Core ontology

Special ontology 1
- Rules 1. Technical

Special ontology 2
- Rules 2. Legal

Special ontology 3
- Rules 3. Reputation

... Special ontology n
- Rules n. Energy

Different modes of effect (Wirkung) or relevance

Barrier.
- Strict
  - “Entering without stop is refused”

Occasional.
- Probability $p\%$
  - “Policeman fines you for stepping the grass”. But this happens with $p\%$ probability – if you do not succeed.

Step-by-step.
- “Reputation/energy is decreased by 10 points”
3 stages

1. Legislative stage
Community

2. Stage of the game – everyday life
Negotiations, contracts, etc.

3. Judicial stage
$p\%$
Judgement

Produce
Rules
A sub-stage of access

2. Stage of the game

The people think in **roles**, not rules

Sub-stage of access. Like “entering an airport”

Citizen, ticket

Passenger
Two legal sub-stages

1a. Legislative rules
   - General rules

1b. Contract rules
   - Individual rules
   - e.g.: Buyer ↔ Seller

2. Stage of the game
   - The people think in roles, not rules

Sub-stage of access
   - Like “entering an airport”
     - Citizen, ticket
     - Passenger
     - Having meals
     - Inter partes

Having meals
4. Formalising technical rules and legal rules
Technical rules

• Interpreted as causation.
• Formalized with the modus ponens rule.

**Example.** (pincode → money) & pincode ⇒ money

(1) Rule(P→Q)  
(2) Fact(P)  
**Conclusion.** Fact(Q)

*Modus ponens* rule in mathematical logic:

\[
P \rightarrow Q, P \quad \vdash \quad Q
\]

‘If and only if’ (↔) interpretation is aimed:

(1) Rule(P ↔ Q)  
(2) Fact(¬P)  
**Conclusion.** Fact(¬Q)
Legal rules

(1) Permission(\(P \iff Q\)) \implies \text{Norm}(P \leftrightarrow Q)

\textit{Example:} green \textbf{if_and_only_if} cross \implies (\text{red} \rightarrow \text{do_not_cross})

(2) Fact(\neg P) \quad \text{– red is on}

(3) Fact(Q) \quad \text{– you cross the street, nevertheless}

\textit{Interpretation.} You are simply a bad guy. Nobody can stop you crossing.

Notes:

• Here \(P\) denotes “green”, \(Q\) denotes “cross”, \(\neg P\) denotes “red”.

• A punishment procedure is exercised with probability \(p\%\), e.g. by a policeman.
Reputation/energy rules

(1) \text{Norm}(\neg A)
(2) \text{Fact}(A)

\textbf{Conclusion}. Energy points reduction by 10%

Formalization:

\[
\begin{align*}
\text{Norm}(\neg A) \\
A \\
\text{-------------------} \\
A := 0.9 \ast A
\end{align*}
\]

Energy is reduced to \( A_1 \), then \( A_2 \) and so on to \( A_n \). And at last \( \neg A \).
5. Norm and status
Spatialization of Norm and Status


III. Normativer Status
Spatialization of Norm and Status

Virtual space

Norm

$N(A)$

Stage

Avatar

Avatar

Avatar

Actions

F. Lachmayer, Grundzüge einer Normentheorie, 1977, Seite 67
Spatialization of Norm and Status

Virtual space

Norm

Status

\[ N(A) \implies O(A) \]

F. Lachmayer, Grundzüge einer Normentheorie, 1977, Seite 67, 76
A Spatialization of Norm and Status

Virtual space

Norm

\[ N(A)_{r1} \]

\[ N(A)_{r2} \]

Status

\[ O(A)_{e(r1-r2)} \]

Stage

Avatar

F. Lachmayer, Grundzüge einer Normentheorie, 1977, Seite 89
6. Example: a girl with her father in a café
The normative status of a girl with her father in a café

r1. Father says “Sit down”
   → Obligatio to sit $O(A)_{r1}$

r2. Implicit permission to speak
   → Permissio to speak $P(B)_{r2}$
r3. A general prohibition to smoke → Vetum for smoking $V(C)_{r3} = O(\neg C)_{r3}$

r4. A specific prohibition to smoke for juvenile → Vetum for smoking $V(C)_{r4} = O(\neg C)_{r4}$
r5. The father asks “What meals will you take?”

→ Permission for meals $= P(D)_{r5}$
The normative status established by the rules $r1$, ..., $r5$

Phase 1) The list of all the 5 consequents:

$$\text{normative\_resultant}_{r1,...,r5} = \{ O(A)_{r1}, P(B)_{r2}, O(\neg C)_{r3}, O(\neg C)_{r4}, P(D)_{r5} \}$$

Phase 2) Duplications are abridged, e.g. $O(\neg C)$:

$$\text{normative\_resultant}_{r1,...,r5} = \{ O(A), P(B), O(\neg C), P(D) \}$$

Duties are connected with $\&$

$$\text{duties} = O(A) \& O(\neg C)$$

Permissions are connected with $\lor$

$$\text{permissions} = P(B) \lor P(D)$$
r6. The father asks “What a soft drink will you take, or cola (E1), or juice (E2), or water (E3)?” → Permission for one soft drink = $P(E1)_{r6} \text{ xor } P(E2)_{r6} \text{ xor } P(E3)_{r6}$
Normative status established by rules $r1, \ldots, r5, r6$

Earlier normative_resultant $\langle r_1, \ldots, r_5 \rangle$ is supplemented with

\[ P(E_1) \oplus P(E_2) \oplus P(E_3). \]

A new normative_resultant $\langle r_1, \ldots, r_5, r_6 \rangle =$

\[ \{ O(A), P(B), O(\neg C), P(D), P(E_1) \oplus P(E_2) \oplus P(E_3) \} \]

Permissions are connected with $\lor$:

\[ \text{permissions} \langle r_1, \ldots, r_5, r_6 \rangle = P(B) \lor P(D) \lor P(E_1) \oplus P(E_2) \oplus P(E_3) \]
A synthesizer of normative status

• Suppose a huge set of rules \( r_1, r_2, \ldots, r_n \).
• What is the normative status, \( O \), of a subject (avatar) \( S \)?
  \[
  O(\text{subject}=S, \text{duty}=X, \ldots) (r_1, r_2, \ldots, r_n)
  \]
  – Has \( S \) a duty \( X \)?
  – Is \( S \) permitted to do \( Y \)?

• “... the power ... does not reside in the inference method; almost any inference method will do. The power resides in the knowledge” (Feigenbaum 1984, p.101)

role, such as “passenger”, “professor”, “CopyLeft”, etc.
Thank you

• **Acknowledgements**: 9 partner organisations of the VirtualLife project
  
  [http://www.ict-virtuallife.eu](http://www.ict-virtuallife.eu)