SITUATION VERSUS CASE AND TWO KINDS OF LEGAL SUBSUMPTION

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Abstract: This paper attempts to separate legal informatics methods which deal with situations and cases respectively. The aim is to base the distinctions on the legal theory and to develop a theoretical framework. A comparison is presented in the table which lists distinctions. We make an attempt to describe key elements of such a theory and to provide a notation (conceptualisation). Informational processes in legal informatics are in the focus. The notions of terminological subsumption and legal subsumption are attributed to cases and not to situations and are visualised “vertically”. They make a distinction from cases that are visualised on the “horizontal” Is stage.

1. Introduction

This paper discusses the notions of situation and case. They are characterised by different methods of legal informatics. We start with a note that a situation stands for a type of behaviour and a case stands for an instance.

Fig. 1: A sample road situation which is presented to an examinee to take a driving theory test. The examinee has to answer a question. In this situation the question is ‘Which order does automobile 2 drive?’ (Blue-red beacon and sound signal are on 4). The right answer: the third, along with 1.
In this paper we attempt to develop a theoretical framework (a conceptualisation). Two theses are defended. First, situations are governed primarily by the principle “Roles, not rules.” Second, in legal cases two kinds of subsumption – textual and legal – are in the foreground.

An example of a situation is a crossroad description. The roles comprise pedestrians and the drivers of different types (car, bus, tram, ambulance, motorcyclist, motorbike, bicyclist, horseman, animal driver, etc.). A sample situation – a crossroad with priorities – is shown in Fig. 1. This is familiar to examinees who take a driving theory test. The test has situation descriptions and questions. Road elements, automobiles and road signs are involved. Drivers’ intentions are described with text and symbols such as arrows. This description makes part of situation’s teleology. The alternatives are essential. For example, examinees answer multiple choice questions.

Another example shows schematic representations of situations in air traffic (Fig. 2).

![Fig. 2: Sample representations of situation types in air traffic.](image)

2. Characterisation of the Concepts of Situation and Case

Situations and cases are characterised differently:

1. **Type.** A situation constitutes a generic behaviour pattern whereas a case – a concrete one.
2. **Ex-ante/ex-post.** A situation is related with *ex-ante* analysis whereas a case – with *ex-post*.
3. **Time.** A situation concerns the future whereas a case – the past.
4. **Alternatives.** Situation: alternatives are possible. This is the essence of a situation. Case: Concrete behaviour. Events are passed.
   However, alternatives can appear in hypothetical evaluations such as “Should the actors perform another manoeuvre, the accident would not happen.”

5. **Language**

   Situation. Situations have no language at all.

   i. A situation is mentally – visually, acoustically, sensibly – interpreted. Suppose a driver in a crossroad (see e.g. Fig. 1). A mental language is non-textual and non-professional. Sensual (visual, aural, etc.) comprehension dominates and textual descriptions appear on the periphery. Hence, a situational language is non-professional. A communication language needs not to be textual; cf. gestures. Therefore a situational language is loosened and differs from case languages.

   ii. Roles are inherent in situations, e.g. “pedestrian”, “driver”, “pilot”. Actors’ legal status may be implicit because rights and obligations are comprised by their roles.

   iii. Artificial agents can use formal languages. As an example suppose multi-agent systems. Agent’s beliefs, desires and intentions are represented in computers in a knowledge representation language.
Case. Witnesses use a non-professional language and jurists – a professional one.

i. Cases are explicitly formulated in documents. *Quod non est in actis, non est in mundo* – “What is not in the documents does not exist”. Cases are textually available. Hence, case languages are textual. Suppose an investigation report. Major facts are described in it. However, statements about facts can be defeated during argumentations in litigations. Visual descriptions such as schemes are supplementary and appear on the periphery.

ii. There are two kinds of languages: first, a non-professional language of witnesses and, second, a professional juristic language. Legal subsumption serves as a bridge.

6. **Placing onto the Is and Ought stages**

   Situation

   i. Situations are assigned to Is. A situation is always real, factual. As an example suppose a crossroad with red light on. You would like to cross but do not want to show children a bad example while they learn the custom law from your behaviour.

   ii. In contrast, the type of a situation is assigned to Ought. A situation type allows visuals representations such as a schema. This appears in technical devices.

Case

i. Cases are also assigned to Is. Every case has passed. The reference range is not important. A case is fixed in the text.

ii. A case is on the Is stage but can be viewed from two perspectives. Firstly, the case is assigned to the subjective law. Secondly, the case is assigned to legal proceeding, hence, to the objective law. Here argumentation arises. The players are assigned legal proceeding roles such as plaintiff, defendant, witness, expert, etc.

7. **Web applications.** e-Government application examples in Austria:

   Situations see in [www.help.gv.at](http://www.help.gv.at). Cases see in [www.ris.bka.gv.at](http://www.ris.bka.gv.at).

8. **Legal instruments.** Distinct legal instruments are concerned:

   Situation: (i) the roles of actors; (ii) assumptions (hypothetical facts); (iii) rules which govern the situation; (iv) additional regulations which govern the situation.

   Case: (i) claim; (ii) evidence; (iii) attacks; (iv) litigation can consist of several cases (e.g. criminal and civil).

9. **Formalisms.** Distinct legal instruments are concerned:

   Situation: deontic logic, abstract normative systems, etc.

   Case: case modelling approaches, factors, etc.


   Situation: slots are partially filled (slotName := value). Alternatives result when empty slots are filled in.

   Case: slots are completely filled (probably with the value “unknown”).

11. **Customary law, machine law and statutory law**

    Situation: customary law and machine law are in the foreground. As an example suppose a zebra crossing. Pedestrians aim to cross it. Statutory law (the road rules) regulates. However, ordinary people are governed primarily by customary law which superimposes. And finally the situation is governed by traffic lights – machine law steps in.
Cases: traditional hierarchies of legal sources prevail.

Cases appear on Is whereas legal rules appear on Ought (Fig. 3). Here we use a visualization pattern that is composed of two stages, the vertical Ought stage and the horizontal Is (Fig. 3). The two stages depict Kelsen’s categorical distinction between Is and Ought; see [Kelsen 1967, § 3ff.].

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Situation</th>
<th>Case</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Examples</td>
<td>1) A crossroad</td>
<td>1) Traffic accident</td>
</tr>
<tr>
<td></td>
<td>2) Airways separation pattern</td>
<td>2) Mid-air collision</td>
</tr>
<tr>
<td>2. Type</td>
<td>Generic, i.e. a type, class.</td>
<td>Concrete, individual, an instance of class.</td>
</tr>
<tr>
<td>3. Analysis</td>
<td>Ex-ante</td>
<td>Ex-post</td>
</tr>
<tr>
<td>4. Time</td>
<td>Future</td>
<td>Past</td>
</tr>
<tr>
<td>5. Alternatives</td>
<td>Possible</td>
<td>Not possible</td>
</tr>
<tr>
<td>6. Language</td>
<td>Mental, non-textual, non-professional.</td>
<td>Textual, professional. Witnesses speak in non-professional language and jurists in professional. Visual representations, e.g. schemas, are supplementary</td>
</tr>
<tr>
<td>7. Language elements</td>
<td>Roles, Legal status implicit in the roles</td>
<td>Roles: plaintiff, defendant, witness, expert. Argumentation</td>
</tr>
<tr>
<td>8. Placing on Is and Ought</td>
<td>Is. In contrast, the type of a situation appears on Ought</td>
<td>Is. Subjective law. Legal proceedings are related to the objective law.</td>
</tr>
<tr>
<td>10. Legal instruments</td>
<td>Roles, assumptions, rules which govern the situation, additional regulations</td>
<td>Claim, evidence, attack</td>
</tr>
<tr>
<td>11. Representation formalisms</td>
<td>Deontic logic worlds which can be accessed in the future</td>
<td>Facts in the past. Different narratives of the players</td>
</tr>
<tr>
<td>12. Frame-based representation</td>
<td>Slots are partially filled</td>
<td>All slots are filled</td>
</tr>
</tbody>
</table>
13. Customary vs. statutory law | Ordering: 1) machine law, 2) customary law, 3) statutory law | Traditional hierarchies of legal sources

14. Bridging | Story-telling

Table 1: A comparison of structural elements of situation and case

2.1. Distinguishing Conceptualisations for Situations and Cases

Situations and cases are described by different concepts. Thus distinct conceptualisations result. A situation is viewed as a state of the world. A situation is not finished. Different scenarios can evolve from the sole state. In terms of logic, central are the different worlds that can be accessed from the given situation. In terms of normative systems, the legal status of the players (normative positions) is a key. Therefore formalisms to represent possible worlds and legal statuses are in the background. Examples are deontic logic (see e.g. [Prakken & Sergot 1996]), abstract normative systems [Tosatto et al. 2012], input-output logic of [Makinson & van der Torre 2012].

Cases are finished and the outcome is known, e.g. “Mr. Lammers is dead shot with a gun”. Thus, the scenario is finished. However, the players may have different stories and this is central. For example, the plaintiff and the defendant may render contrary arguments, e.g. “Rijkbloem shot” and “Mrs. Lammers shot”. There is a variety of case modelling approaches; see e.g. a special issue of Artificial Intelligence and Law 16(2) (2008), esp. Prakken. Formalisms for arguments, stories and evidence comprise a hybrid formal theory [Bex et al. 2010] that combines argument-based and story-based approaches.

2.2. Distinguished Elements in Situations and Cases

Which elements are important in the constellations of situations and cases? Figure 4 shows core elements which make the differences.

**Fig. 4: Situation and Case. Attention and Subsumption.**

**Situation.** Here attention is the most important element. Attention can be compared with a cursor that can change to different positions. The players reside similarly as on a stage and make scenes like people around a table. A script assigns the players their roles.
Case. Here legal subsumption, i.e. bringing the text under norms, is in the front. It is important that the case elements are relevant to norms. The elements of the issue have to be named in a professional legal language. Cases are marked by verbalisations. Here relationships – references – of the text to the relevant norms are dealt with.

3. A Notation for Situations and Cases

3.1. A Notation for Situations

A situation appears on the horizontal Is stage and is described by the following entities (Fig. 5):

1. **Situative elements.** These are constituents of the situation. They are denoted by small letters, e.g. a, b, c, driver, pedestrian, etc. They exist in time and space.

2. **Relations** between the situative elements. There are many kinds of relations: causal (c →), teleological (te →), instrumental (instr →), context (contx →), etc. These relations are comprised by both legal relations such as debt, but also of empirical non legal relations. The relations represent different perspectives.

![Fig. 5: A notation (conceptualisation) for situation.](image)

The alternatives of behaviour are important. Suppose you do not have money and therefore you cannot take a tram, but if you have you can take a transport. For example, the notation for a causality relation “a causes b” is a c → b.

A predicate language can serve to represent situations; cf. block worlds in early artificial intelligence. Situative elements are represented by constants (0-arity predicates). A relation of arity n is represented by a predicate R(a1, a2, ..., an).

**Distinguishing representations for humans and computers.** Human beings and computers use different formats of representations and reasoning to act in a situation. Humans employ essentially more formats than computers.

Human beings comprehend a situation with their senses. Human’s brain makes a decision which action to take. In a situation, a human reasons primarily in terms of roles not legal rules. Predicate logic is not in the forefront in human decision making unless a computer decision support system is employed (e.g. air traffic controllers). However, predicate logic can be employed to model and justify an action that was taken.

Computers in a multi-agent systems use computer knowledge representation formats. Predicate logic and other representations of n-ary relations can be used. Computer agents use machine inference to take a decision on an action. However, computers can be more effective than humans in
specific tasks. Suppose making an emergency action based on instrumental sensors. An example is an airborne collision avoidance system (ACAS)\(^1\).

The picture in Fig. 1 should be used by an individual to pass the driving test. However, a similar situation can happen to three drivers on a real road, too. An unmanned vehicle could also occur there. Each actor would use different representation of the situation and different decision making.

3.2. A Notation for Case

The facts of a case are transformed into legal terms. The facts are obtained from story-telling, witnesses, etc. For example, an action, \(a\), is treated as a theft, \(A\), not a burglary. This makes a first kind of legal subsumption, called *terminological subsumption*. A notation is \(a =\equiv A\). The *instance-of* notation of computer science can also be used, \(a\) *instance-of* \(A\). A prefix form *instance-of*(\(a,A\)). A pool of legal terms is used for the terminological subsumption. Legal ontologies can serve here.

\[\text{Fig. 6: A notation (conceptualisation) for case.}\]

The second step is a *normative subsumption*. Here the norm \(\text{Norm}(\text{obligatory } A(x) \text{ otherwise sanction } B(x))\) is applied to subsume a sanction \(B\). The first step, terminological subsumption, corresponds to the unification. It is linked with the minor premise. The second step, *normative subsumption*, corresponds to the major premise \(\forall x \in D \text{Norm}(A(x)/B(x))\).

The conceptualisation above is similar to the following form of inference (cf. the syllogism and also the *modus ponens* rule):

**Minor premise:** Socrates is a human

**Major premise:** Humans are mortal.

**Therefore,** Socrates is mortal.

The notation (actually a conceptualisation) for the case concept is shown in Fig. 6.

Story-telling serves as a bridge between situations and cases. As an example suppose a judge in a court announcing the verdict of a case. The meaning of the judge’s speech act is a legal act. The

\(^1\) An aircraft system that operates independently of ground-based equipment and air traffic control in warning pilots of the presence of other aircraft that may present a threat of collision. If the risk of collision is imminent, the system indicates a manoeuvre that will reduce the risk of collision; see [http://en.wikipedia.org/wiki/Airborne_Collision_Avoidance_System](http://en.wikipedia.org/wiki/Airborne_Collision_Avoidance_System).
verdict contains a statement of grounds. It is presented as a kind of story-telling. It summarises the established facts and their interpretation and is the official version of the story.

3.3. Modelling the Terminological Subsumption

To model the subsumption procedure, conceptual modelling formalisms which are used in computer science can be applied. The general relationships is-a, instance-of and part-of are used in object-oriented analysis and systems development. Suppose the fact that my-door is open and the norm N “The doors ought to be closed”. The norm can be formalised with the following rule: if x is an instance of Door, then x ought to be closed. Formally, \( \forall x \in \text{Door} \Rightarrow O \text{ closed}(x) \), where O is the deontic operator and closed a predicate. The situation (fact) with the instance my-door is from the Is world. The fact is interpreted according to a norm from the Ought world which contains the door concept Door. Then my-door is matched with Door, formally match(my-door, Door). This can be simplified and expressed with a truth statement instance-of(my-door, Door) or my-door eDoor. This truth statement is from the Is world. A graphical notation is shown in Fig 5. A duty which is conferred on me, to close my-door, is from Ought. In the Is world I can decide to leave my-door open thus violating the norm.

![Graphical notation of the instance-of relationship, instance-of(my-door, Door) or my-door eDoor.](image)

This visualizes that my-door (from the Is world) is matched with the Door concept within the norm N which is from Ought.

Fig. 7: Graphical notation of the instance-of relationship, instance-of(my-door, Door) or my-door eDoor. This visualizes that my-door (from the Is world) is matched with the Door concept within the norm N which is from Ought.

4. Conclusions

This paper aims to contribute to formalising informational processes in the domain of legal informatics. The first step is to identify the notions which distinguish legal situations from legal cases. They are summarised in the table. Two kinds of subsumption – terminological and normative – are central in the case concept. Providing a more rigorous notation is a work in progress.

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