The objective is to decompose statements from a legal binding document (contracts/ agreements) to constructs – Obligated, Rights, Privileges, Prohibited that can be reasoned and compared.

Since, these systems have their grounds on accurately defining or being representative of the laws set by lawmakers, it is important to understand what semantic meaning these laws convey. It can be noticed, that interpretation of law is not straightforwardly logical, however these are loosely coupled. Through the mould hypothesis, we know that we can arrive at the *Thought* by its footprints on a *Language* [1]. However, in legal contexts there is often a deeper meaning to what is observed in the law itself which is represented as a language [2]. It appears to follow the ordinary language philosophy, where meaningless words can take meaning based on context of the legal case.

Figure 1: Car IS-A Vehicle, Coop MAYBE-A Vehicle?

For instance, there was a legal case between Garner and Burr in 1951 [2]. The legislature had made it an offence to use a "*vehicle*" on a road without pneumatic tires. The case was that Burr drove a *chicken-coop* using *iron tyres*. The magistrate initially acquitted him, going by the judgement that *chicken-coop* is not really a *vehicle*. Later Burr was convicted, in the appeal court, based on the fact that the intention of the law was to protect roads and the iron tyres damaged the roads. In this context, the *chicken-coop* takes the subject of type *vehicle* and must be under the modality "Prohibited".

If a law directly specifies a value/ limit which when violated is applicable (*normative law* [3]), then this is directly a Permitted/ Forbidden entry to the NLP engine. Speed limit rule on highways is one such example. However, if the law is abstractly worded, the *purpose* of the legislation is also significant. The purpose can induce other conditions otherwise not specified in an abstract law. From the previous example, we see that the coop has a wheel and this wheel damages the road. The *purpose* of the law was to protect the roads and this implicit relationship is assumed by law-makers and these extra conditions must be specified. Hence, in the system the statements transform into,

Vehicle HAS-A PneumaticTyre = Permitted (From the *normative law*)

!Vehicle HAS-A !PneumaticTyre = (Can be Permitted or Forbidden after *Purpose*)

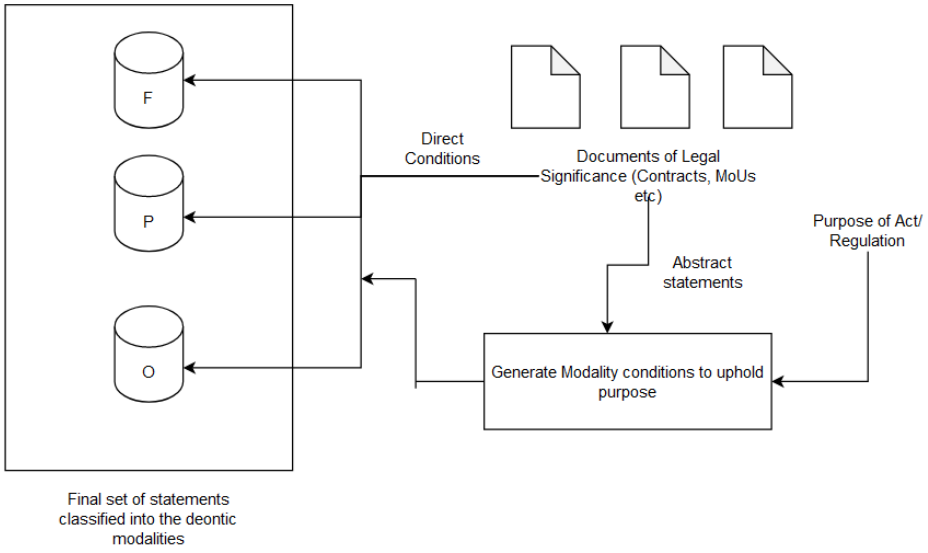

Figure 2: Conversion of Legal Texts (Both Direct and Abstract) to Deontic Modalities

The implication "*Vehicle HAS PneumaticTyre = Permitted*" is a direct condition with Permitted modality. If the *vehicle* does not have a *PneumaticTyre* then it is a violation of the law. Now, referring to Garner v Burr case above, a second condition has to follow which will uphold the purpose from the abstract law.

Purpose hence plays a central role to legislatures/ law-makers. Actions of the subject can be permitted/ forbidden by determining its interaction with *Purpose*. As mentioned previously, the law is loosely-coupled and is tightly restricted at the boundaries when *Purpose* comes into the picture. As depicted in Figure 2, to classify abstract statements from the law, modality conditions are generated for the system based on the purpose of the regulation. Semantic analysis can be applied along with statistical similarity for relationships between a generic term (as observed in a law statement) and instances of that term. Additionally, word relationships can be derived from current lexical databases like WordNet.

[1] https://randomgraphs.blogspot.com/2013/03/does-language-shape-or-distort-thought.html

[2] https://plato.stanford.edu/entries/law-language/

[3] George E. Glos, The Normative Theory of Law, 11 Wm. & Mary L. Rev. 151 (1969),

https://scholarship.law.wm.edu/wmlr/vol11/iss1/6

Mandate 1