An Exploratory Study on Vagueness in Website Privacy Policies

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Abstract

Website privacy policies are often overlooked due to their length and difficulty to understand. The goal of this research is to create a framework to help define and identify characteristics of vagueness within a text document. Legal perspectives in relation to the "void for vagueness" doctrine and linguistic perspectives regarding comprehension were investigated to create this framework. Further analysis can lead to the use of machine learning and natural language processing to aid in identifying vagueness within these documents.

Motivation

"Void for Vagueness" Doctrine
- States that a law or regulation must be clearly specified for the average person to understand
- If a law or regulation does not satisfy this requirement, statutes can be considered unconstitutionally vague and unenforceable
- Existence of this doctrine implies vagueness can be reduced [11,17]

Why Website Privacy Policies?
- Privacy policies contain important information outlining the agreement between the user and the company
- These policies are often too long or too difficult to understand
- Policies are often overlooked and ignored
- Casual users have greater difficulty understanding policies than experts [2,14,16]

Vagueness is subjective [1], making it difficult to quantify vagueness and create an effective way of classification. Because privacy policies are not easy to understand, natural language processing becomes a relevant approach [13].

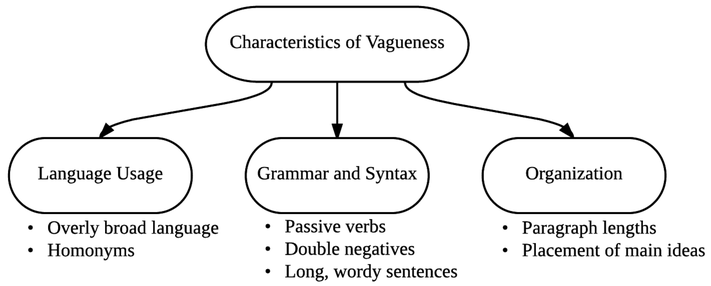
This study hopes to better define vagueness, identify clear characteristics, and establish where it can arise. With a better understanding of vagueness, there is potential to better understand natural language.

Investigation of Vagueness

Indeterminacy relates and describes cases involving vagueness, ambiguity and contestability [17]. While the three cases are distinct and create specific situations, indeterminacy and debate are involved [8,9,12].

Vagueness is introduced in borderline cases which require further interpretation and examination [1,6]. These borderline situations arise when there are not clearly specified conditions. Vagueness can arise when there are no specific words or terminology to best describe concepts [5].

Linguistic characteristics can be used to describe text vagueness [4,10]



Some terms associated with vagueness include: "may," "except," "aside from" [10]. The table below also includes an additional 40 vague key words and phrases [15].

Results from Applying Taxonomy to Privacy Policies

Category	Key Words and Phrases	Distribution*
Condition	depending, necessary, appropriate, inappropriate, as needed, as applicable, otherwise reasonably, sometimes, from time to time	7.20%
Generalization	generally, mostly, widely, general, commonly, usually, normally, typically, largely, often, primarily, among other things	3.63%
Modality (including modal verbs)	may, might, can, could, would, likely, possible, possibly	70.60%
Numeric quantifier	anyone, certain, everyone, numerous, some, most, few, much, many, various, including but not limited to	18.60%

Table 1: Table adopted from (Reidenberg et. al. 2016). It includes 40 vague key words and phrases divided, manually identified by experts, and organized into established categories.

Key Terms

Privacy policy excerpts that were marked "unclear" by Amazon Mechanical Turkers were extracted from the database in "Extracting Key Practices from Website Privacy Policies" [18].

Below is an example of an excerpt with highlighted vague expressions manually identified to be added to the list of 40 vague terms previously defined.

> We may match information collected from you through different means or at different times including both personal information and Service usage information and use such information along with offline and online information obtained from other sources (including third parties) such as demographic information and updated contact information (where that information has been lawfully disclosed to us) for the purposes of learning more about you so we can provide you with relevant content

Future Work

This study creates a framework to identify vagueness within text documents. To further this research, we hope to create a machine learning algorithm to classify vagueness.

Implementing a classifier, potentially Multinomial Naïve Bayes, Logistic Regression, or Support Vector Machine, will help classify a text as vague or not vague. Introducing the idea of saliency, the amount a word contributes to the final composed meaning, this classifier can focus on words with the highest significance [3,7].

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