Towards the Ontology-Based Legal Prompter for the Internet

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Abstract. With the advent and systematic development of the Internet, human life has changed dramatically. Most of the activity of a modern person takes place in a virtual environment (that is, on the Internet), which is not the case until recently. However, the joy of the opened opportunities of the virtual environment is sometimes overshadowed by legal liability, which is very often unjustified. The state pressure on the Internet user is carried out through ill-considered laws, which are also applied incorrectly. It is time to talk about the legal security of the user on the Internet. This paper describes a Legal Prompter for working on the Internet. It is assumed that this is a program that will be installed on the computer like an antivirus program and will prompt the user about legal dangers in the process of the user's work in the Internet environment. Strict adherence to the advice of a legal prompter will guarantee that a conscientious user will avoid legal liability when working on the Internet.

I. Introduction

An effective method for dealing with complexity is to divide the whole into parts. This method has been known since time immemorial, but we have become accustomed to ascribe the articulation of this method to the ancient Romans. Since then, this method or principle has often been mentioned in Latin, namely, "divide et impera". The ancient Romans successfully used this method in politics, but it is also effective in many other areas. This principle is based on the "part-whole" relationship, which is one of the main types of relationships encountered in reality. That is why this type of relationship is used in almost every conceptual model. Analysis of the "part-whole" relationship reveals its contradictory nature. This is clearly visible in practice, for example, if we look at the state and its citizens through the prism of the "part-whole" relationship. On the one hand, the usefulness of the state for its citizens is obvious. On the other hand, the personal interests of citizens sometimes contradict the interests of the state. For example, this happens in the legislative sphere, when a certain law is adopted, but even law-abiding citizens have to avoid its responsibility. There may be many reasons for the need to avoid the effect of the law: an unformed public point of view on the regulated area, poor legislative activity, improper law enforcement, or unfair work of the judicial system. People are residents of the physical world and avoiding responsibility for an inappropriate law or its enforcement lies in the so-called physical plane. As a rule, this is the use of a lawyer. It is clear that a lawyer is used when some violation is established and a person needs qualified assistance. In the ideal case, it would be to avoid even partial execution of the crime, but for this, everyone needs professional legal experience, or "dragging" a lawyer on his or her heels day and night (a lawyer would warn his client about the visible potential of legal risks in the course of life), which is technically impossible.

Modern human lives not only in the physical world, but also in the virtual world. Here the virtual world is the Internet, where, unlike the physical world, interaction occurs not through physical contacts, but through the exchange of mental categories such as information, thoughts, emotions. Unfortunately, the state seeks to completely control the virtual environment (the Internet) through legal regulation, which is often unjustified. The fact is that the legal regulation of the

physical world (everyday world) and the virtual world should differ, but modern states are engaged in regulating the Internet without changing their approaches, as if they were dealing with the physical world. Therefore, it is necessary to develop a method of legal protection of the average user from the inadequate presence of the state on the Internet. We are not talking about committing intentional crimes in the virtual sphere; we are talking about warning the user about legal risks when working on the Internet. And if in the physical world there is no possibility to "drag" a lawyer with you always and everywhere, then, when working on the Internet, it is possible to develop some software that will pass through a legal sieve the information that comes to the user's personal computer from the Internet. Such software is similar to anti-virus software, only anti-virus software checks incoming information from the Internet for viruses, and this software will check information from the Internet for legal risks. We called such software a Legal Prompter for the Internet. In this paper, the concept of a Legal Prompter for the Internet is developed.

This paper is structured as follows. The next section overviews some researches in the legal sphere from the point of view of application in the field of artificial intelligence. The third section examines the virtual environment that is the Internet and identifies its similarities and differences with our physical world. The fourth section describes the Legal Prompter for the Internet in detail. The paper ends with a conclusion.

II. Related work

The legal sphere occupies a significant part of modern people's lives. A large number of cases in modern states would be impossible without regulation by legal norms and laws. This concerns both technical issues and issues related to public welfare. The possibilities of formalizing information, which is provided by ontologies as part of the Semantic Web concept on the one hand, and the absence of fundamental difficulties in formalizing the legal sphere using ontologies on the other hand, determine early attempts to implement the Semantic Web in the legal sphere.

The ontology of law in functional perspective was presented as a number of primitive functions of legal sources and corresponding categories of legal knowledge: normative knowledge, world knowledge, responsibility knowledge, reactive knowledge, creative knowledge and meta-level knowledge [1]. The book "Law and the Semantic Web" represented a collection of papers by different authors and described the introduction to the laws and the Semantic Web, methodologies and practical applications [2]. Much research is being done in the context of creating a digital government. One includes explorations of current and future policy implications, and case studies of successful applications in a variety of government settings [3]. Another provides the latest research advancements and findings for the scientific systematization of knowledge regarding digital governance and transformation, such as core concepts, foundational principles, theories, methodologies, architectures, assessment frameworks and future directions [4]. The abundance of scientific research in the field of jurisprudence in relation to the Semantic Web has given rise to many practical applications. For example, InvestigatiOnt tool was presented which aimed to ease the interaction of end users with legal ontologies in order to spread the use of machine-processable legal information as well as its understanding [5].

InvestigatiOnt tool is far from the only tool, but it is certainly not the last one that a person needs. As technology develops, the quality of human life increases, but at the same time, some risks increase. The Internet is one of the technologies that has dramatically increased the quality of human life. One of the risks that has appeared with the development of the Internet is the risk of legal liability when working on the Internet. Adequate legal regulation of any sphere usually creates a minimum of risks. We are talking about the risks of legal liability when working on the Internet due to excessive regulation of the Internet, and this regulation is based on distorted ideas about the Internet.

III. Virtual environment

The problem is that the legal regulation of the Internet is approached in the same way as the legal regulation of our everyday life in the physical world. For example, the distribution of prohibited things in the everyday physical world and the distribution of information on the Internet seem to legislators and lawyers to be, if not identical, then almost identical acts. But the Internet is not a synonym for the everyday physical world, but a completely special phenomenon that requires a special attitude, including in the legal sphere.

Any environment serves to unite the elements that comprise it. The result of this unification is the synchronization of the elements of this environment. In this sense, any environment is similar to a common support on which several pendulum clocks hang, the oscillations of the pendulums of which begin to coincide, i.e., to synchronize, as Huygens showed [6]. There are many types of environment. World currency (for example, the US dollar in the 20th century) is a common commercial environment for commodity-money interactions. The Internet is a virtual environment or an environment of mental "secretions" of people, i.e. ideas, thoughts, feelings, fantasies. These mental "secretions" are constantly synchronized in time, achieving stability in some issues, and instability in others. In a sense, the Internet is a living collective consciousness, life in which is daily supported by the efforts of millions of users who supplement and correct the content of the Internet. It would be strange to impose restrictions on the mental, conscious activity of man. Consciousness and thought activity are the last freedom of man, which is available even to prisoners. In one's thought activity, absolutely everything is permissible, even the most unrealistic, immoral and unnatural assumptions. Even crimes are permissible in mental activity, because there is a huge difference between the thought of a crime and the crime itself, and it is wrong to punish for thoughts, even if these are thoughts of a crime. The same is true for the content of the Internet: it is counterproductive to limit the diversity of the content of the Internet by removing certain categories of information. Another thing is that it is impossible to do without regulating the Internet at all, because some information can really lead to bloodshed, and some passions and desires of some users can harm the not fully formed psyche of others. Nevertheless, we must understand that this is an exceptional action and we cannot overdo it in such regulation.

To summarize, we can highlight two main resources of the Internet:

1) User communication,

2) A large amount of information.

It seems that in order to regulate access to the above-mentioned resources it is necessary to develop a client-server system of permission for access (Fig.1). That is, where information or communication needs to be restricted for someone, a corresponding file with an access policy should be placed. The server describes what it provides, and the client describes what it wants and does not want to see. Alternatively, the client can allow any information, but block some users by IP address, regardless of the program they use.
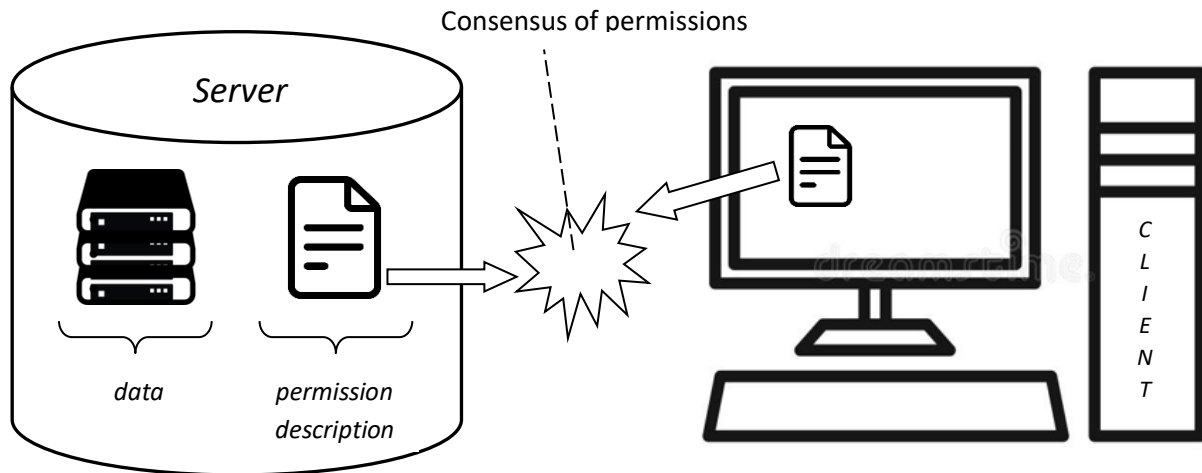

Fig.1. Client-server system of permission for access.

It is unlikely that those who simply distributes information in the hope of finding like-minded people should be punished with fines or imprisonment. The main property of information is the need for its distribution, so why punish users who realize this need. If someone does not want something, let him clearly state it and there will be no problems. When we talk to someone in the park, we do not run to the police every time what the interlocutor tells us goes beyond our picture of the world. The Internet is such a public park where you can meet an interlocutor for any taste. However, until this understanding is generally accepted, we must rid the average user of the problems caused by excessive regulation of the Internet. For this purpose, it is proposed to develop a computer program that will serve as a legal prompter for the user while working on the Internet. The main details of this program will be discussed in the next chapter.

IV. Legal prompter for the Internet

The highest judge for each person is himself [7]. Ultimately, a person evaluates his own actions, deeds and then makes a verdict. But you can become an objective judge only when your picture of the world has no subjective distortions. The difficulty is that the picture of the world of any person has its own distortions. Therefore, in order for the individual diverse ideas of people not to lead to conflicts, general rules of coexistence are introduced in society. General rules for society are laws, and it is laws that form society from a disparate group of people. Thus, the emergence of laws in a group of people signifies its self-organization.

A: work order

Self-organization has also affected the Internet in the sense that regulation by laws has come here too. In order to function on the Internet without breaking the laws, a special computer program is offered that will help the user avoid legal liability when working on the Internet. A special

computer program is a Legal Prompter for the Internet. The nature of this program is simple. This program is launched when the OS starts and works in real time, like an antivirus program. If an antivirus program analyzes what is happening on the computer for virus or network security, then a Legal Prompter for the Internet analyzes the user's actions for possible violations of laws. Whether prohibited information from the Internet gets into the computer (for example, terrorist information) or there is a risk of making limited information publicly available (for example, intimate information) or there is communication with a minor, etc. - this is the area of responsibility of the legal prompter. To some extent, the Legal Prompter's area of responsibility overlaps with that of the parental control program, but the parental control program is much more limited in its capabilities. The list of actions of the proposed program is similar to the list of actions of the antivirus program: information support about work on the Internet, blocking of certain actions that can lead to problems with the law, an offer to the user to perform an action, or to refuse it, an offer of safer alternatives for the same results. It is recommended to relieve the user of any legal liability when working on the Internet if he conscientiously uses the Legal Prompter program during work on the Internet.

B: architecture

The architecture of a Legal Prompter for the Internet directly depends on the features of the legal sphere. The main feature of the legal sphere is its great diversity, since different countries have different laws. Moreover, the laws of the same country are constantly changing based on changing circumstances in society. Therefore, a center for monitoring the legislative activity of the state is needed, whose employees will supplement the Legal Prompter database with information about newly emerging laws. This will allow the Legal Prompter to remain relevant. In this regard, the legal prompter program is a classic client-server architecture, where the client program is installed on the user's computer, which exchanges information with the server part of the Legal Prompter via an Internet connection (Fig.2.):
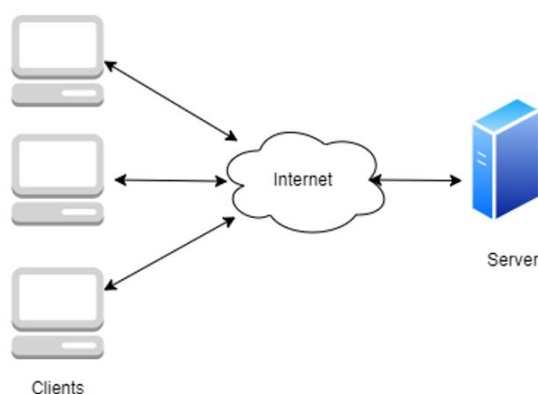

Fig. 2. Architecture of legal prompter.

The server part of the Legal Prompter stores information about laws in a technically convenient form and is located in some center, and the client part of the Legal Prompter is located on the user's computer and has access to updates of information about newly adopted laws via the Internet. The client part analyzes the user's activity when the user interacts with the Internet and takes appropriate actions to avoid legal liability, namely informing about legal threats, blocking risky applications, etc. The analysis of activity by the client part is carried out both when

installed on the computer and when the user directly works on the Internet, i.e. in the "on the fly" mode.

C: knowledge base

Knowledge representation is a key issue when creating a Legal Prompter. Here, knowledge refers to laws that need to be stored in order to be able to analyze information and/or user actions on the Internet. There are several possibilities for representing laws in a Legal Prompter, but using ontologies for this is the most suitable way. Ontologies are part of the Semantic Web [8] concept, and their use is growing day by day. The wide distribution of the Semantic Web technology and its part, i.e. ontologies, is the first advantage. The available tools for processing ontologies, such as programming languages and libraries, are the second advantage. The ability to generate rules from ontology is the third advantage [9], [10].

Descriptions of laws are well structured, so they are easier to transform into ontologies than ordinary, raw text. At the same time, the technical ease of transforming laws into an ontology does not guarantee the user of a Legal Prompter based on an ontology the correctness of the work in all cases. This is due to the low level of development of the legal sphere in some countries. For example, performing certain songs in Latvia can result in a fine. But it is impossible to determine from Latvian laws for which particular song you will be punished. This is so because there is no list of prohibited songs. In Latvia, you can be punished for performing even a folk song about love (if it is a folk song of Latvia's national minorities). In such cases, the description of laws will say little about rights and obligations, and the solution may be to track law enforcement practice. Unfortunately, the level of legal development of such a country is approaching the level of legal development of Babylon under King Hammurabi [11]. Therefore, not only an ontology generated on the basis of laws, but also an ontology generated from law enforcement practice is necessary for the high-quality work of a Legal Prompter.

V. Conclusion

This paper presents the idea of implementing a Legal Prompter for the Internet. A Legal Prompter is necessary to prevent violations of the law when a user works on the Internet. The need for a Legal Prompter arose in response to the penetration of law into the Internet, which is expressed in the adoption of many laws that regulate activities on the Internet, and establish legal liability types of user activities on the Internet. In addition to presenting the idea of a Legal Prompter for work on the Internet, this paper mentions some details (namely, the technologies used) of the future implementation. First, we are talking about ontologies, which are part of the Semantic Web concept. In addition to a Legal Prompter for the Internet, there are other possibilities for using Semantic Web technologies in the legal sphere. For example, ontologies can be used to assess the quality of the legal mechanism of an entire country. Let us take the criminal code as an example. To assess the quality of the criminal code, it is necessary to create an ontology of this criminal code, and then compare it with the previously created ontology of law enforcement by articles of this criminal code. Differences will reveal problems in the adopted laws and/or their law enforcement, which will improve the quality of the legal sphere of the state. Moreover, this, in turn, will reduce discontent in society, which will result in higher labor productivity and fewer nervous disorders. This would require developing a way to find differences between ontologies, but this does not seem to be an insurmountable obstacle.

Acknowledgments

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