



S.I.Vavilov Institute for the History of Science and Technology (RAS)

WHY ARE LAWERS ALWAYS BEHIND? The disastrous situation with lawmaking in IT

Yuri M. Baturin
Corresponding member of RAS

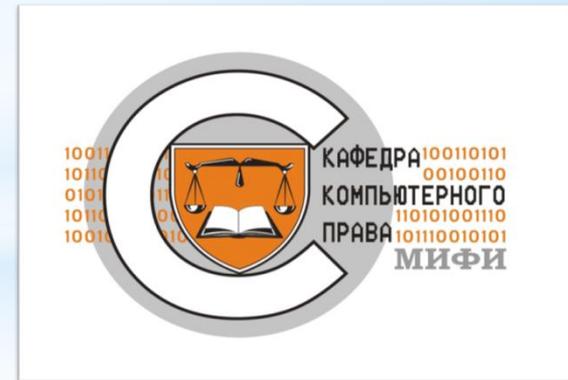
**INTERNATIONAL CONFERENCE ENGINEERING TECHNOLOGIES AND
COMPUTER SCIENCE: INNOVATION & APPLICATION**

Moscow, June 24/ Oct.10-14 , 2020



NOTES FROM MEPhI CHAIR (1996-2013)

- In the middle of 1990th the attempt to teach computer law in law schools was completely defeated
- Well, if lawyers don't want to learn the technology, let's try to teach the techies to teach law.
- The Chair of Computer Law at the Moscow Engineering Physics Institute was successful (1996-2013)
- But the success was not complete. Engineers began to understand the law, but they never became lawyers
- Legal education is as difficult as that of a doctor and requires many classic courses





SECOND ATTEMPT

(Lomonosov Moscow State University, 2015-2020)

- The number of hours (education time) of classic legal program has not been reduced
- But the law students do not have a system of science concepts, and therefore they do not understand the logic of technical processes



LEGAL NORMS OF INTUITIVELY UNDERSTOOD RELATIONSHIPS

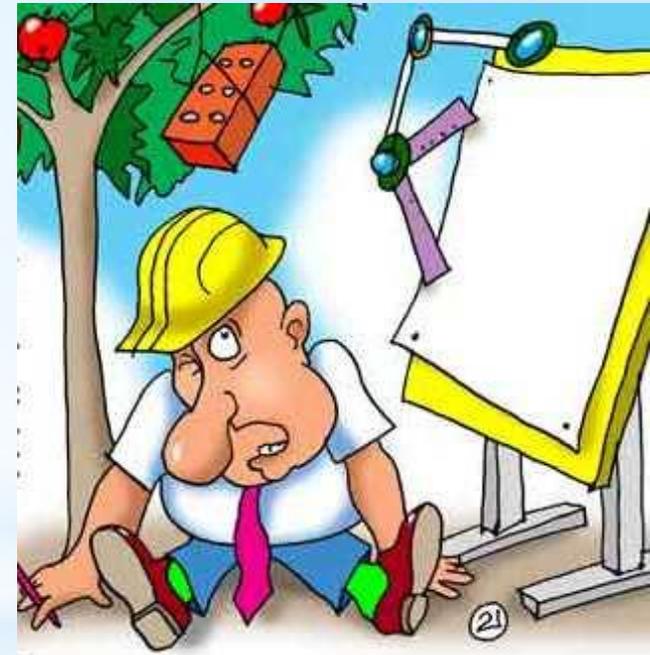


- Ancient Roman lawyers have established that if an object was placed on the windowsill of a tall house or, moreover, hung from its roof so as to threaten falling and causing harm, then any citizen could sue the owner of the house, without even waiting for the actual injury (*action de positis et suspensis* = "for the put or suspended")
- Instinct suggested that if a heavy object falls from above, then damage is inevitable.



TWO THOUSAND YEARS LATER IT'S THE SAME

Newton's method in the construction



- Having already learned Newton's law, a person will learn to take into account the parameters of a falling object, the impuls energy, the angle of the object's fall, the area of contact with the victim's body...
- ...but the law has not moved to any other way of formulating rules. All the same signs prompted by instinct



SECOND ATTEMPT - II



(Lomonosov Moscow State University, 2015-2020)

- I entered three introductory courses: “Mathematical Foundations of Computing”, “Physical Foundations of Communication Theory” and “Engineering Analysis of Networks”
- The following statement can be considered the initial axiom: “A scientific description of the world is possible through the concepts of “Matter”, “Energy”, “Information”, “Space” and “Time ”
- These five components have different properties (see Table 1, next slide), which has predetermined the appearance of arrays of legal norms that are very different in size and in character, formulated using basic and derived concepts.

Basic concepts of describing the world and the properties of their entities



Table 1

Properties of entities Concept	Integrity degree	Sustainability	Submission to the laws of conservation
Matter	Unitarity	Reproduction	Yes
Energy	Divisibility	Convertibility	Yes
Information	Multiplicity	Copyability	No
Space	Connectivity	Transformability	No
Time	Changing: Continuity - Discontinuity - Discreteness	Uniqueness	Yes taking into account interruptions

MATTER AND LAW



- Matter is the essence of matter, material substance.
- Ancient Roman lawyers started with the real world, with material law, and today this is a significant fragment of the corpus of law
- Property law has gone the longest way of development, and therefore its formulas are well honed over the centuries
- They are based on a common property of various types of manifestation of physical substance in the corporal form, which we will call materiality
- Students do not have any problems with this concept



INFORMATION, SPACE AND LAW

- Today no one doubts the validity of N. Wiener's formula: "Information is information, not matter or energy»
- The concepts of the information series of "first necessity" (zero layer) are distributed according to a layered scheme that defines a "coordinate system" in the semantic space that allows encoding the meaning of the concept through the number of the layer (see Table 2, next slide)
- From the basic concept of "space", two types of concepts are derived – indicating localization in space and a change in position in space
- Space for the operation of legal norms is not as simple as it looks at first glance
- Net is kind of Space

Multi-layer development of some special concepts



Table 2

Layer	Concept	
0. (base)	«Information» (I)	«Space» (S) Localization Change of position
1.	«findings», «data»	«content» «transfer» «storage» «storage»
2.	«message»	«address» «net» «network»
3.	«package», «packet»	«converting» «sending», «delivery»,
4.	«channel» «link»	«port» «connection»
5.	«signal»	«reception» «transmission»
6.	«code», «sign», «symbol»	«discretization» «modulation» «digitalization» «transition 0→1 or 1→0» «measurement» «quantum superposition»

TIME AND LAW



- Time is a condition for the possibility of change, the course of a physical process, duration
- Network time values are represented in binary format, in which the bits are numbered starting from zero, from left to right, includes a 16-bit field of whole seconds and a 16-bit field of fractions of a second

0	15	16	31
Seconds		Fractions of a second	

- Malicious computer software is embedded in the field of fractions of a second, and it is extremely difficult to detect it, because any external signs indicate that the computer is malfunctioning due to changes in milliseconds and even in microseconds, although several timestamps may be required within one second
- Try to prove to the judge that the modification of network time for just one microsecond balances the long term of imprisonment on the scales of Themis.

ENERGY AND LAW



- The signal has an energy nature (the electric signal is sent and received due to the consumption of electric power), but the concept of "energy" et al from the concept law (E) are not frequent participants in the relations regulated by Russian legislation
- Energy is related to information. The maximal information content that can be transmitted by a signal with energy E_0 is equal to the change in the entropy of a physical system that transfers information from a state with energy E_1 to a state $E_2 = E_0 + E_1$
- Energy is also a necessary condition for the life of the signal. A signal is a physical agent of information, an object of transportation over a communication channel from a computer transmitting a message to a receiving computer.
- Communication is the transportation of a signal, and energy is one of the characteristics of a signal, or more precisely its state
- For legislation, it will be necessary to use new legal concepts from the law (E)

IT-LAWYERS' SKILLS AND COMPETENCIES



- Understanding the impact of technical characteristics of modern digital devices and services on the processes of solving legal problems;
- Understanding of algorithms not only for legal actions, but also information technologies for the correct definition of their legal regime and regulatory regulation;
- Knowledge of the basics of programming to understand the "technical language" and effectively conduct interprofessional discussion of legal issues

CONCLUSIONS



- 1) The upcoming integration of distributed software, autonomous agents, the IoT and AI into decentralized networks of mutual information exchange is a direct challenge to the scientific and technical environment for lawyers.
- 2) In the Digital Turn for future and practicing lawyers are especially important to technical skills and expertise in the field of applied sciences.
- 3) IT-lawyers preparation should be ahead of future challenges in order to ensure the security of the state, society and citizens.
- 4) Without such reforms in legal education in the current decade, we risk losing control over new social and technological processes.
- 5) A scitech possesses the developed system of concepts. But only their small part is used by lawyers. The problem of legislation as a whole is the disordered nature of the introduced concepts.

WHY LAWYERS MUST RUN AT LEAST TWICE AS FAST AS THAT?



“A slow sort of country!” said the Queen.

“Now, here, you see, it takes all the running you can do, to keep in the same place. If you want to get somewhere else, you must run at least twice as fast as that!”

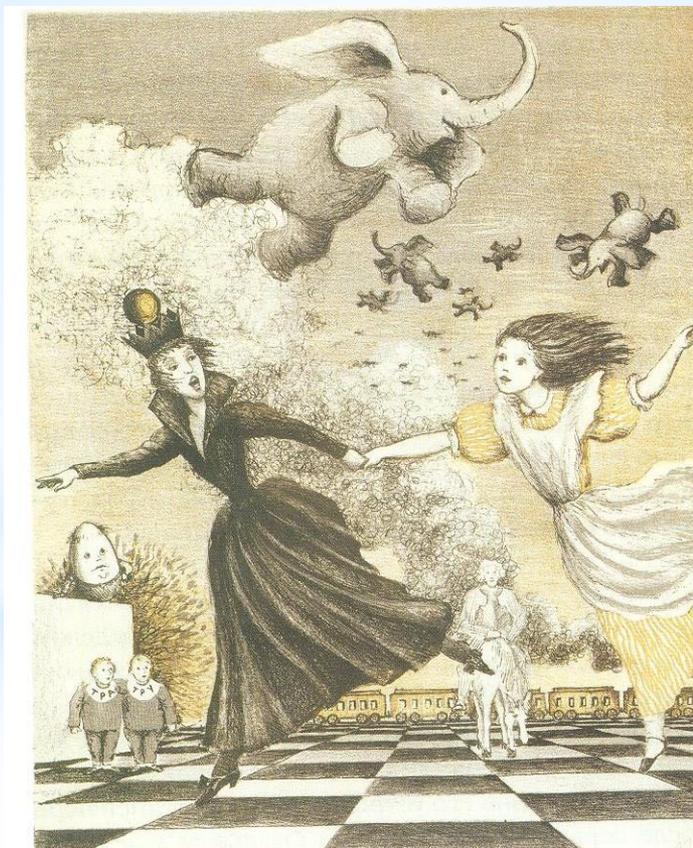


*(Lewis Carroll.
Through the
looking-glass)*

©Ralph Steadman, 1967



THANKS ALL!



© Abramova O., 1982

Collection by A.M. Rushailo