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Article

The electronic knowledge publishing based on intellect modeling

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Abstract: This paper focuses on a new concept based on modeling human intelligence for electronic knowledge publishing. It discusses the limitations of current publishing methods in solving real-life problems and proposes the need for a new type of publishing. It identifies two main streams of publishing: Emotional publishing and knowledge texts publishing, highlighting the challenges of the latter. The article evaluates various attempts in the field of Artificial Intelligence, such as expert systems and neural networks, in terms of knowledge transfer and problem-solving. It suggests that understanding the principles of human intelligence, as exemplified by the character Sherlock Holmes, can contribute to the development of the proposed "Intellect Modeling" concept. Overall, the article presents a comprehensive proposal that addresses the shortcomings of existing publishing models and offers a new approach that incorporates advancements in Artificial Intelligence and Knowledge Management.

Keywords: knowledge publishing; information technology; artificial intelligence; intellect modeling; knowledge management

1. Introduction

Publishers attacking! It is widely known what it is publishing. Publishers' products are around us all the day. And sometimes it seems that they overproduce it. Why do we speak about a new kind of publishing? Is it not enough?

Sorry for taking your time, but we would like to attract your attention to the questions of suitability of publishers' production for solving tasks of real life and, in connection with it, to needs of a new kind of publishing.

The aim is to introduce electronic knowledge publishing as extension of traditional publishing presenting knowledge contained in books in very convenient and effective way.

2. Materials and methods, results and discussion

This section provides the general experimental design and methodologies used. The aim is to provide enough details for other investigators to fully replicate results. It is also facilitate better understanding of the results obtained. Protocols and procedures for new methods are included in detail to reproduce the experiments.

This section also focuses on the results of the experiments performed and discussion.

2.1. Knowledge and knowledge publishing

There are, by our opinion, two main streams of publishing: Emotional publishing and Knowledge publishing.

Emotional publishing has a goal to put people into some emotional state. In

principle, there is no difference in this case between texts, pictures, sounds, movies, computer animations, and scents. The result should be emotional state in any case.

Knowledge, as we believe, is a basis of an ability of a person to understand what is going and to act effectively in accordance with a situation.

Individual knowledge is internal matter for a person, so no one needs, as a rule, to present this knowledge in external form for self, such as text, picture etc. Sometime people use external objects to activate their knowledge, but as we think, if they have no knowledge inside already, nothing could be activated.

Knowledge existed long before any language was created. In fact, knowledge is one of the common features of living beings. A language was created partially for that purpose to pass individual knowledge to other persons, making this knowledge public and, if needed, everlasting.

Thus, there was appeared external presentation of knowledge such as speech, texts, pictures etc. Primarily a speech and derived from speech text, that is a pictorial presentation of speech, are main modes of external presentation of knowledge. Therefore, we can call this type of publishing – knowledge texts publishing. It is subdivision of knowledge publishing.

We understand that this division of publishing on emotional and knowledge publishing is not very strict. The best emotional publishing, as a rule, contains some important knowledge about people, nature, and that makes it the most interesting. And many knowledge teachers try to present knowledge in a very attractive way.

Moreover, what is the problem with it?

The problem is that nobody can use effectively knowledge without making it individual tacit knowledge. There were appeared such branches of human activity as a teaching, learning and self-teaching. As a rule, teaching takes a long time and many efforts. Therefore, we find that an impact of knowledge publishing on real life is strictly limited—a hard-working long-time learning is needed to get and use knowledge.

A human life is not long enough to learn all the knowledge even in a very special area. Many people say about information explosion. So, what we can do? Treasure becomes larger with every day, but for a whole life a person can use just a little part of it!

There is no problem, of course, if we have a human near us who already possesses needed knowledge. We call this human an expert. We just can describe a situation to expert and get an advice how to act and what could be a possible result. The better case is if we can get advice from all the best experts and choose the better advice.

However, it’s not easy thing to manage this consulting. As a rule, experts live in different places and have a very limited time for a communication. We know that it is rare luck to get an advice from a good expert. Moreover, it is almost impossible to gather several good experts, especially in urgent cases.

Deadlock?

There were many efforts to bypass these problems. There were attempts to define a structure of knowledge texts, to introduce key words, hypertexts, databases, fuzzy search engines, Knowledge Management Suites, LLM etc. It makes easier to find knowledge texts regarding existing problems.

And in many simple cases it is working very effective. For example, you can use a detailed instruction to maintain your TV set. It is interesting that even in this case before action human needs to self-teach to make knowledge internal. However, if a situation was not described in an instruction or a manual is very thick, you will call experts.

Other ways?

Yes. There were attempts for to imitate an expert's activity. We can call works of W.Maccalloh and W.Pitts (Neural Networks); F.Rosenblat (perceptron); M.Minsky and S.Papert (anti-perceptronism, frames); Newell, Simon and Shaw (Logician-Theoretician, General Problem Solver); B.Buchanan and E.Feigenbaum (expert systems, DENDRAL, decision trees); E.Shortliffe (MYCIN, EMYCIN, deduction machine); H.Pople and J.Mayers (CADUCEUS); J.McCarthy (Artificial Intelligence, LISP); M. Ross Cuillian (semantic nets); R.Schank and R.Abelson (conceptual dependence, scripts, Script-Applier Mechanism, Memory Organisation Packets); A.Samuel (Self-teaching program); P.Winston (Arches); R.Michalski (self-programming, AQ11); G.Simon and P.Langley (programs for discoveries "Bacon"); D.Lenat (Automatic mathematician, Evrisco, RLL, CYC project); D.Hillis (Connection Machines, Thinking machines corporation); G.Hinton and S.Falmen (Boltsman machine) and many, many others. The most popular in this branch of research known as Artificial Intelligence (AI) are computer programs called expert systems and devices called neural networks. An expert system is an example of a 'top-down' approach when particular instances of intelligent behaviour selected and an attempt to design machines that can replicate that behaviour was made. A neural network is an example of 'bottom-up' approach when there is an attempt to study the biological mechanisms that underlie human intelligence and to build machines, which work on similar principles. There is interesting approach called Case Based Reasoning (CBR). It is applied to search similar cases in many help desk systems. However, it is not based on intellect simulation [1–3].

Were those attempts successful?

Sorry, but it is hard to say so. And is it a crisis of human intellect?

Maybe it is a crisis of human self-confidence. In the beginning, there were many promises to built machines more intelligent than people themselves. And those machines should use advanced principles of work, much better than obsolete human intellect [4]. In this case, it is very interesting what can be called an intellect, but is based on other principles than developed by evolution?

Therefore, we believe that the real task is to help human intellect, to make it more powerful and more creative, to let knowledge work for people using the principles developed by evolution.

And what are those principles?

2.2. How do you do it, Mr. Sherlock Holmes?

Let us look at the activity of the fiction's most famous detective Mr. Sherlock Holmes. It is known that he has as prototypes real men: Dr. Joseph Bell of the Edinburgh Infirmary and Sir Arthur Conan Doyle himself [5]. So, the methods of Mr. Sherlock Holmes are realistic and widely recognized.

"No data yet... It is a capital mistake to theorize before you have all the evidence. It biases the judgement". (Mr. Sherlock Holmes) A Study in Scarlet [5].

"I had... come to an entirely erroneous conclusion which shows, my dear Watson, how dangerous it always is to reason from insufficient data." (Mr. Sherlock Holmes) The Adventure of the Speckled Band [5].

Following Mr. Sherlock Holmes, we can formulate the demand:

1) An expert should have maximum possible information about a case before a judgment.

"You seem to be a walking calendar of crime", said Stamford with a laugh. You might start a paper on those lines. Call it the Police News of the Past? (to Mr. Sherlock Holmes) A Study in Scarlet [5].

"Kindly look her up in my index, Doctor." For many years he had adopted a system of docketing all paragraphs concerning men and things, so that it was difficult to name a subject or a person on which he could not at once fournish information" (Mr. Sherlock Holmes) A Scandal in Bohemia [5].

"Like all other arts, the Science of Deduction and Analysis is one which can only be acquired by long and patient study, nor is life long enough to allow any mortal to attain the highest possible perfection in it." (Mr. Sherlock Holmes) A Study in Scarlet [5].

Following Mr. Sherlock Holmes, we can formulate the demand:

2) An expert should possess a maximum possible knowledge in a sphere of activity.

"Now the skilful workman is very careful indeed as to what he takes into his brain-attic. He will have nothing but the tools which may help him in doing his work, but of this he has a large assortment, and all in the most perfect order." (Mr. Sherlock Holmes) A Study in Scarlet [5].

Following Mr. Sherlock Holmes, we can formulate the demand:

3) An expert should possess no excessive knowledge, should have nothing but the tools, which may help in doing work.

"As a rule, when I have heard some slight indication of the course of events, I am able to guide myself by the thousands of other similar cases which occur to my memory." (Mr. Sherlock Holmes) The Read-Headed League [5].

"They lay all the evidence before me, and I am generally able, by the help of my knowledge of the history of crime, to set them straight. There is a strong family resemblance about misdeeds, and if you have all the details of a thousand at your finger ends, it is odd if you can't unravel the thousand and first." (Mr. Sherlock Holmes) A Study in Scarlet [5].

Following Mr. Sherlock Holmes, we can formulate the demands:

4) Getting an indication of the course of events, an expert should be able to guide by the thousands of other similar cases which occur to memory.

5) Possessing information about the thousands of cases, an expert should have an ability to find a strong family resemblance about them, i.e. to find templates of typical cases.

"As a rule… the more bizarre a thing is the less mysterious it proves to be. It is your commonplace, featureless crimes are really puzzling, just as a commonplace face is the most difficult to identify." (Mr. Sherlock Holmes) The Read-Headed

League [5].

"I have already explained to you that what is out of the common is usually a guide rather than a hindrance." (Mr. Sherlock Holmes) A Study in Scarlet [5].

Following Mr. Sherlock Holmes, we can formulate the demand:

6) An expert should focus on the most unusual in descriptions of situations.

"From long habit the train of thoughts ran so swiftly through my mind that I arrived at the conclusion without being conscious of intermediate steps. There were such steps, however. The train of reasoning ran, here is a gentleman of a medical type, but with the air of a military man. Clearly an army doctor, then. He has just come from the tropics, for his face is dark, and that is not the natural tint of his skin, for his wrists are fair. He has undergone hardship and sickness, as his haggard face says clearly. His left arm has been injured. He holds it in a stiff and unnatural manner. Where in the tropics could an English army doctor have seen so much hardship and got his arm wounded? Clearly in Afghanistan. The whole train of thought did not occupy a second." (Mr. Sherlock Holmes) A Study in Scarlet [5].

Following Mr. Sherlock Holmes, we can formulate the demands:

7) An expert should have an ability to explain the grounds of conclusion.

8) An expert should arrive at the conclusion for a few seconds after getting a description of case.

"... you now pretend to deduce this knowledge I could only say what was the balance of probability. I did not at all expect to be so accurate." (Mr Sherlock Holmes) The Sign of Four [5].

Following Mr. Sherlock Holmes, we can formulate the demand:

9) An expert should estimate a level of confidence of propositions.

"In solving a problem of that sort, the grand thing is to be able to reason backward. That is very useful accomplishment, and a very useful one, but people do not practise it much. In the everyday affairs of life it is more useful to reason forward, and so the other comes to be neglected. There are fifty who can reason synthetically for one who can reason analytically...Most people, if you describe a train of events to them, will tell you what the result would be. They can put those events together in their minds, and argue from them that something will come to pass. There are few people, however, who, if you told them a result, would be able to evolve from their own consciousness what the steps were which led up to that result. This power is what I mean when I talk of reasoning backward, or analytically." (Mr. Sherlock Holmes) A Study in Scarlet [5].

Following Mr Sherlock Holmes, we can formulate the demand:

10) An expert should have an ability to take into account not only descriptions of situations in memory but results as well, providing a possibility to reconstruct a description from a result.

"For example, observation shows me that you have been to the Wigmore Street Post-Office this morning, but deduction lets me know that when there you dispatched a telegram ... The rest is deduction ... Why, of course I knew that you had not written a letter, since I sat opposite to you all morning. I see also in your open desk that you have a sheet of stamps and a thick bundle of postcards. What could you go into the post-office for, then, but to send a wire? Eliminate all other factors, and the one which remains must be the truth." (Mr. Sherlock Holmes) The Sign of

Four [5].

Following Mr. Sherlock Holmes, we can formulate the demand:

11) An expert should have an ability to point out all impossible hypotheses.

2.3. 11 demands of Mr. Sherlock Holmes

"He possesses two out of the three qualities necessary for the ideal detective. He has the power of observation and that of deduction. He is only wanting in knowledge, and that may come in time." (Mr. Sherlock Holmes) The Sign of Four [5].

Following Mr. Sherlock Holmes, we can describe steps of expert's activity:

- Observation;
- Producing propositions, based on a knowledge;
- Elimination of impossible propositions;
- Selection and verification of the most appropriate propositions.

Thus, if we want to help human intellect, to make it more powerful and more creative, we should make a knowledge machine, which could assist during these steps. Let us name demands to such a machine.

Step 1: Observation

1) A knowledge machine should have maximum possible information about a case before a judgment.

Step 2: Producing propositions, based on knowledge

2) A knowledge machine should possess maximum possible knowledge in a sphere of its implementation.

3) A knowledge machine should possess no excessive knowledge, should have nothing but the tools that may help in doing work.

4) Getting indication of the course of events, a knowledge machine should be able to guide itself by other similar cases, which occur to its memory.

5) A knowledge machine should have an ability to take into account not only descriptions of situations in its memory but results as well, providing a possibility to reconstruct a description from a result, i.e., if you told it a result, it would be able to evolve what the steps were which led up to that result.

6) Possessing information about the great number of cases, a knowledge machine should have an ability to find a strong family resemblance about them, i.e. to find templates of typical cases.

7) A knowledge machine should have an ability to explain the grounds of its conclusion.

8) A knowledge machine should arrive at the conclusion for a few seconds after getting a description of case.

9) A knowledge machine should focus on the most unusual in descriptions of situations.

Step 3: Elimination of impossible propositions

10) A knowledge machine should have an ability to point out all impossible propositions.

Step 4: Selection and verification of the most appropriate propositions

11) A knowledge machine should estimate a level of a confidence of its

propositions

2.4. AI expert systems and neural networks

Let us look at the Artificial Intelligence expert systems. Expert system, as we understand, is based on the idea of decision tree, when, with every answer to a program's question, a direction of moving through a tree changes until a final leaf (decision) will be reached [1].

So not all possible questions will be asked, and not maximum information will be received.

The key elements are decision rules, but no knowledge itself. Not a word about the thousands of other similar cases, about typical cases.

As we see, expert systems originally are designed to be deduction machines. However, it is not very reliable to entrust to machine deciding what is impossible. We think that approach that is more fruitful is to show what reasons to consider some hypotheses as impossible are. Only man should make the final decision.

It is not amazing that development and implementation of a successful expert system is very hard work, because experts cannot think, as a rule, in terms of decision trees, and the mathematical theory of probability have a little in common with a feeling of a confidence of an expert.

Let us look at the Artificial Intelligence neural networks. Neural network is based, as we know, on the idea of teaching of set of elements (neurons), controlling conductivity between them [2]. Teaching is going usually under control of expert, which defines whether attempt is successful.

- A Neural Network is oriented on automatically produced decision rules rather than on knowledge itself. Therefore, there are no thousands of other similar cases in memory of Neural Network. And it does not produce several correct propositions simultaneously, like in a case of multiple medical diagnoses of one person.
- A Neural Network cannot explain reasons of own conclusion in terms that people can understand. So it is very hard to verify correctness of its activity and, therefore, to rely on its activity. LLM AI chatbots might explain own reasoning by falsified explanations called hallucinations. "The new AI. Systems are "built to be persuasive, not truthful," an internal Microsoft document said. This means that outputs can look very realistic but include statements that aren't true…The chatbots are driven by a technology called a large language model, or L.L.M., which learns its skills by analyzing massive amounts of digital text culled from the internet…By pinpointing patterns in that data, an L.L.M. learns to do one thing in particular: guess the next word in a sequence of words. It acts like a powerful version of an autocomplete tool. Given the sequence "The New York Times is a ____," it might guess "newspaper." … They produce new text, combining billions of patterns in unexpected ways. This means even if they learned solely from text that is accurate, they may still generate something that is not…But becoming more accurate may also have a downside, according to a recent research paper from OpenAI [6]. If chatbots become more reliable, users may become too trusting. "Counterintuitively, hallucinations can become more

dangerous as models become more truthful, as users build trust in the model when it provides truthful information in areas where they have some familiarity", the paper said [7].

- OpenAI CEO Sam Altman, leader of most powerful AI ChatGPT development, says: "But a consistent issue with AI language models like ChatGPT is misinformation: The program can give users factually inaccurate information." Altman said relying on the system as a primary source of accurate information "is something you should not use it for," and encourages users to double-check the program's results [8].

2.5. Building knowledge machine

And if we could build a knowledge machine satisfying 11 demands, it should mean that we could introduce a new kind of publishing—publishing of knowledge itself. This way published knowledge could be used for tasks of real life with very few additional efforts.

How to build such a knowledge machine?

Famous experts in Artificial Intelligence (AI) Alan Newell and Herbert Simon, developers of General Problem Solver, proposed to define memory elements as rules called 'Productions' of the following type 'If Situation Then Action'. We have a right to suppose, taking into account this definition and opinion of Mr. Sherlock Holmes, that big and important part of knowledge consists of following 3-parts elements:

(Description of real problem—Name—Action and Result), that is called a concrete knowledge, or (Description of problem template—Name—Action and Result), that is called an abstract knowledge (we think that this kind of knowledge grows out of a concrete knowledge for a long lifetime).

We know that we can get information about knowledge from speech or texts. But they can be so amazingly long ... just like this paper. So, we should have to prepare a text of knowledge for input into a knowledge machine in a special way. How?

Let us consider the following example. There is a need to develop a knowledge machine designed to assist in recognizing the authors of pictures. We pick up a fragment from "Renaissance painting from Brueghel to El Greco" by Lionello Venturi [9].

"Like the Florentines, a Parma artist Francesco Mazzola (1503–1540), known as Parmigianino (i.e., little Parmesan), tended to the use of abstract forms, but, less doctrinaire in his abstractionism than such man as Rosso and Pontormo, he achieved a fragile grace and delicacy, reminiscent of Raphael and Corregio. His universal popularity contributed largely to the spread of mannerism in Europe.

The Madonna of the Long Neck (Uffizi, Florence) illustrates to perfection of his aesthetic. Here elegance replaces beauty and the somewhat abstract treatment of the figure gives it an immaterial charm. His sfumato, his discreet allusions to reality, the elongation of proportions and the sinuous movement of his figures were enthusiastically followed up by many painters in the second half of Cinquecento."

This can be formalized as follows in a form (Description of problem template—

Name—Action and Result), because it is abstract knowledge.

Description of problem template:

Description of problem consists of sentences that we call description signs. Every description sign, in principle, may have grades, usually five [10], for example (1—Very Low, 2—Low, 3—Moderate, 4—High, 5—Very High), or have no grades at all. It is very important that every sign in description should be clear to any person and has one meaning. It is highly recommended to use sign in every description when it should be apparent.

In our case, description of situation is a set of ideas, derived from painter's style description from previous fragment:

- Tendency to the use of abstract forms
- Fragile grace and delicacy
- Elegance replace beauty
- Sfumato
- Elongation of proportions
- Sinuous movement of figures.
- In our example, as we see, no description sign has grades.

Name:

"Possible author is Francesco Mazzola (Parmigianino) from Parma, Italy (1503–1540)."

Action and result:

Description of action consists of sequence of sentences that we call action signs. Every action sign describe a sequence of elementary actions called steps. Of course, there could be just one step.

In our case, there are no action signs.

Description of result consists of sequence of one or more sentences that we call result sign.

In our case result sign could be:

"Possible author is Francesco Mazzola (Parmigianino) from Parma, Italy (1503–1540)." Since result is identical to the name here, in principle, it may be omitted.

Step 1: Observation

Let us look how (Step 1: Observation) could be realized in a knowledge machine.

We gather all description signs, from all elements of knowledge that we have, eliminate synonyms and duplicates, and numerate signs and their grades. Signs numeration sequence does not matter because numbers are just for a convenient reference. For an easiness of perception, we can group signs any way, regardless of their numbers. As a result, we get a chapter of problem's description input form called (1 Descriptions signs). The second part of problem's description input form chapter (2 Actions signs) consists of action signs, arranged in a way similar to description signs. The number of any action sign may not coincide with number of some description sign. The third part of input form chapter (3 Results signs) consists of result signs, arranged in a way similar to description signs. The number of result sign may not coincide with a number of some description sign or action sign. In principle, chapter (1 Descriptions signs) or (2 Actions signs), but not both, may not

be present. Chapter (3 Results signs) may not be present at all.

So we get a form for input of description of problems with 3 chapters—(1 Descriptions signs), (2 Actions signs), (3 Results signs). For our example, it should look like this:

Problem's description input form:

1) Description signs

- Tendency to the use of abstract forms;
- Fragile grace and delicacy;
- Elegance replace beauty;
- Sfumato;
- Elongation of proportions;
- Sinuous movement of figures.

2) Actions signs

None.

3) Results signs

200 Possible author is Francesco Mazzola (Parmigianino) from Parma, Italy (1503–1540).

In this form, we should point out only that signs and grades, which are suitable for a description of existing problem.

Generated signs:

In some cases, there is a need to generate some useful signs using those, which can be observed directly. The quotation follows.

"The train of reasoning ran, here is a gentleman of a medical type, but with the air of a military man. Clearly an army doctor, then. He has just come from the tropics, for his face is dark, and that is not the natural tint of his skin, for his wrists are fair. He has undergone hardship and sickness, as his haggard face says clearly. His left arm has been injured. He holds it in a stiff and unnatural manner. Where in the tropics could an English army doctor have seen so much hardship and got his arm wounded? Clearly in Afghanistan?" (Mr. Sherlock Holmes) A Study in Scarlet [5].

The observed signs are:

- A gentleman of a medical type;
- The air of a military man;
- Face is dark;
- Wrists are fair;
- Haggard face;
- He holds left hand in a stiff and unnatural manner.

The generated signs (propositions) are:

- Army doctor;
- He has just come from the tropics;
- He has undergone hardship and sickness;
- Man has been injured.

Obviously, proposition itself could be a sign for further propositions. But we would like to remind that completely routine generation of propositions has to be tuned very carefully, otherwise it is not sufficiently reliable.

Step 2: Producing propositions, based on knowledge

Let us look how (Step 2: Producing propositions, based on knowledge) could be realized in a knowledge machine.

Initially, we should numerate *Name* parts of knowledge elements, which will be used as propositions, just for convenient reference. It will look like:

All possible propositions names:

1) Francesco Mazzola (Parmigianino) from Parma, Italy (1503–1540)
2) ...
3) ...

Every proposition is accompanied with a list of numbers of signs and grades from problem's description input form.

Getting the most possibly full description of problem, we could build a list of elements of knowledge with the most similar descriptions. It could be presented in a menu-like list of propositions, sorted according to indexes, which present value depended on degree of similarity. In our case of authors of pictures recognition assistance it will look like:

- The highly valuable propositions
- Index Number Proposition
- 90% 1) Francesco Mazzola (Parmigianino) from Parma, Italy (1503-1540)
- ...

It is very interesting question what could be an index. We think that there are many possible solutions, but we developed our own Proposition Value Index, based on idea of member of USSR Academy of Science Livanov [11] that the essence of memory associations is a spatial-temporal coherence of narrow-band periodical oscillations of central neurons sets activity [12].

Step 3: Elimination of impossible propositions

Let us look how (Step 3: Elimination of impossible propositions) could be realized in a knowledge machine. We know that knowledge element may have as a Name part a proposition like:

2) Parmigianino may not be an author.

Propositions of this type usually are very valuable, if Proposition Value Index is used. So, there's a possibility to verify manually – are there any objections against your favourite propositions?

Step 4: Selection and verification of the most appropriate propositions

Let us look how (Step 4: Selection and verification of the most appropriate propositions) could be realized in a knowledge machine.

If you choose some proposition from list to get additional information, you should get a list of signs on which proposition is based. In our case, if we select the proposition:

- 90% 1) Francesco Mazzola (Parmigianino) from Parma, Italy (1503–1540).

It should be like:

- Proposition was made according to the following signs;
- Sfumato;
- Sinuous movement of figures;
- ...

Next step: An additional information for more detailed verification of proposition should be present. It should be like:

- Francesco Mazzola (Parmigianino) from Parma, Italy (1503–1540);
- Tendency to the use of abstract forms;
- Fragile grace and delicacy;
- Elegance replace beauty;
- Sfumato;
- Elongation of proportions;
- Sinuous movement of figures;
- ...

And you have a possibility for additional verification.

We may try to use LLMs like ChatGPT to find ideas needed to build knowledge machine, by asking "Summarize" and "List great ideas". But anyway, the list should be fine tuned by human expert. We should double-check LLM's output as Altman warns!

3. Conclusion

We humans are bound by intellectual abilities. All knowledge is far beyond power of any person. The only way to apply knowledge is to build machines able to present it human way but not limited by volume.

Intellect Modeling Kit (IMK) is intended to build knowledge machines (KM) assisting experts on the steps of activity:

- Observation;
- Producing propositions based on knowledge;
- Elimination of impossible propositions;
- Selection and verification of the most appropriate propositions;
- Memorizing—new knowledge item creation;
- Abstraction—building objects representing typical signs of similar objects groups, data mining.

KM is not intended to replace human experts; it is built to multiply abilities. Machine should not be responsible for decisions.

The IMK is designed to create ready-to-use software applications using simple text files. Any human knowledge can be uploaded to KM by expert not familiar with software coding. Demos present in the kit.

Intellect Modeling Kit (IMK) is an open-source project located at Sourceforge repository (http://sourceforge.net/projects/gkm-ekp).

IMK was used for development of knowledge machines in areas of medicine, business, research, arts and psychology. Useful downloads may be found at project's site.

KM Renaissance Painting is using ideas source: Renaissance painting from Breughel to El Greco, text by Lionello Venturi, Translated by Stuart Gilbert. This kind of system is intended to assist in paintings evaluation. Its download present at https://sourceforge.net/projects/gkm-ekp/files/gkm-ekp/v4/gkm-intellect-modeling-kit-v2020b-renaissance-painting-win-linux.zip/download

KM Toxicology consulting point is using questionnaire verified with the Churchill Livingstone Pocket Medical Dictionary. This kind of system is intended for practitioners and patients to assist in setting toxicology diagnosis. System is

evolving: on July 2017 it recognizes 128 types of poisoning. Beta-tester from USA states: “I like it. Would be ideal for the practicing emergency physician. More references other than emedicine may be more comprehensive. But otherwise, very useful.” Download released at https://sourceforge.net/projects/gkm-ekp/files/gkm-ekp/v4/gkm-intellect-modeling-kit-v2019b-toxicology-win-linux.zip/download.

Will it be fight between traditional knowledge texts publishing and Electronic Knowledge Publishing?

No, we do not think it should be. Electronic Knowledge Publishing could be valuable extension of traditional publishing, because it suggests the fastest way to use knowledge contained in published books. The customers are the same as for digital editions. One more option of edition type choice should be added: Softcover book, Hardcoverbook, Ebook, EKbook (Electronic Knowledge book). EKbook includes Ebook + Electronic Knowledge System based on that Ebook. EKbook development should not demand significant investments; it is much easier that initial book writing. The expert author or specially trained person could develop EKbook usually in few weeks. EKBook also might include knowledge from several EBooks. The customers that try to compare Ebook and EKbook versions probably would prefer EKbook with time, advertising their choices to correspondents.

We think that prospects to apply knowledge of many people to problem solving, such as diagnostics, legal cases, management consulting etc., are attractive to all.

Eunika Mercier-Laurent states in a paper The Future of AI or AI for the Future “The third hype of AI and enthusiasm for applying last techniques in all fields raise great interest and some important questions on the future directions in AI research and applications. Guiding by the principle of combing the best from human and computers capacities this chapter lists some important challenges to face and related directions in AI research” [13,14].

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