

Press-Release of the Meralabs Company

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MeraLabs researchers have developed and patented a technology that allows creation of infinitely expanding repositories of electronic documents.

According to Dmitry Ponomarev, General Director of MeraLabs and President of MERA, the newly developed technology constitutes a radical departure from the well-known principles of building relational databases and object-centric models: “We suggest an entirely new architecture for distributed systems designed for retention and efficient search for digital documents stored as XML files. We call this breakthrough technology ‘Mera rEvolutionary Repository Architecture’ or ‘MERA’. The technology involves keeping documents on many TCP/IP-connected computers the population of which may grow infinitely, without any detrimental effect on the speed and effectiveness of data search that allows a variety of search criteria: key words, location IDs, object name, fuzzy requests and so on.”

“The mathematical object, metrized graph with properties of the “small world”, which we inquired into, forms the basis of the architecture” — says professor Krylov, Research Supervisor and Technical Director for MeraLabs, an affiliate of the Mera group of companies. Such approach allowed us to do away with centralized indexing and use a distributed system of cross-links for all documents stored in the repository. Adding a document to the repository means just tying it to the set of links pointing to documents already in the repository, following a special algorithm. By these means every document in the repository gets its own list of links.

When a search query arrives with certain search parameters an XML document with a similar intrinsic structure called “search mask” is generated. This search mask is added to the repository in the same way as all other documents; and a search of XML documents matching most closely the mask starts. The search begins with the analysis of local links pointing to all “immediate relations” of the mask, and a transition to another document in the repository occurs. Then another suite of “immediate relations” is analyzed and the traversal repeats. The search ends when either the perfect match for the mask is found, which would be a document that is absolutely

identical to the mask, or a set of documents within a predefined range of similarity to the mask is selected. All the selected documents are considered relevant to the request. The need to make the size of every local directory (i.e. the quantity of “immediate relations” for the document) small even in huge databases called for an inquiry into an exotic domain of mathematics.

MeraLabs researchers believe that the suggested database architecture will provide a solution to the problem of building and maintaining huge and dynamic databases intended for keeping descriptions of various real world objects. By way of example, the suggested architecture allows the implementation and open-ended expansion of any real estate, merchandise and equipment inventories. “We possess a technology for information systems capable of storage, prompt update and quick retrieval of data about all things — motor vehicles, weapons of war, customs and excise duty products etc. Such systems are easily connectable to RFID readers and could materially alleviate damage from mishandling, trafficking and abuse of products commonly subject to strict scrutiny and control by governmental agencies”, — says Dmitry Ponomarev, — “The suggested architecture allows the creation of variegated registries. Product life-cycle systems, multimedia content libraries, DNS registers are just a few potential users of our technology”.

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