

Assessment of the Trustworthiness of Digital Records over Time

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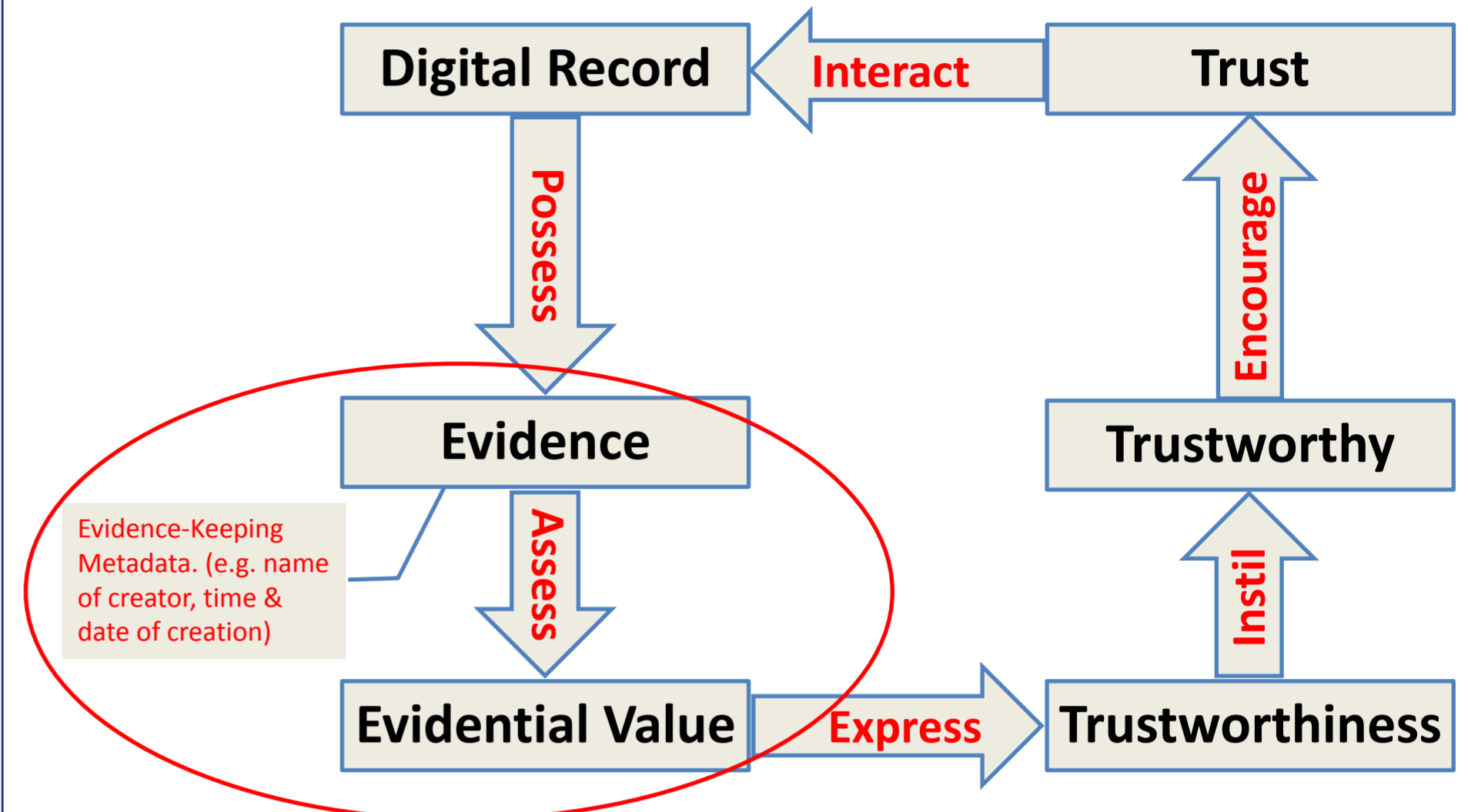
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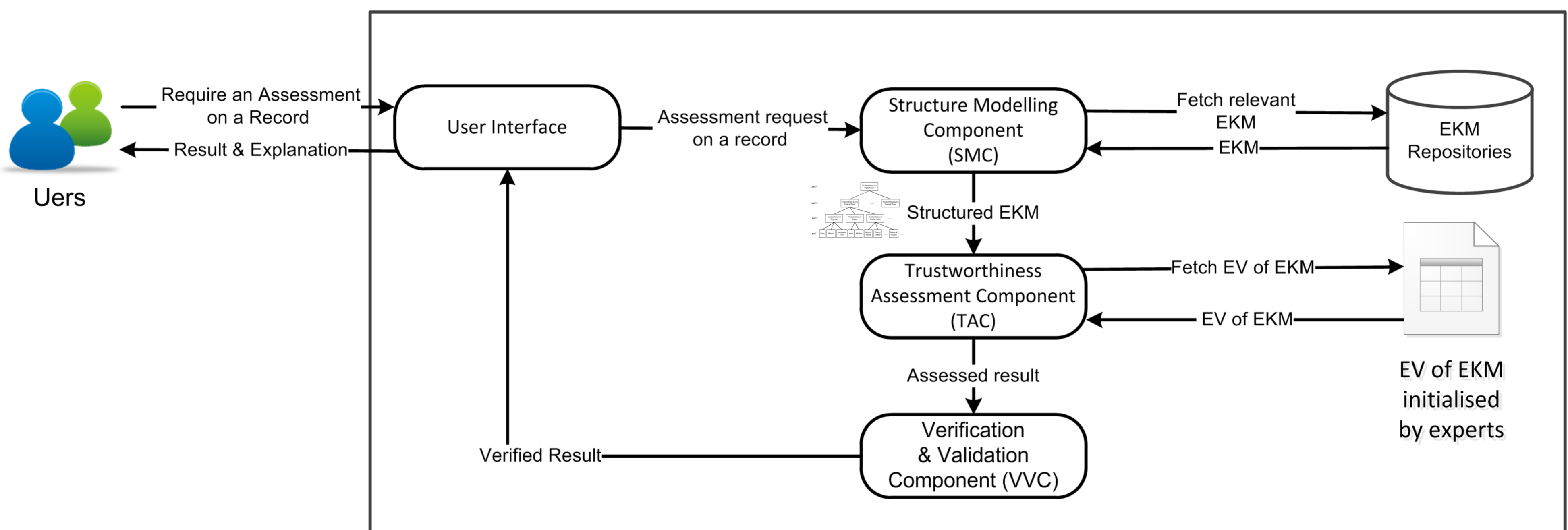
Are digital records trustworthy?

Digital documents can easily be compromised or tampered with, especially, the archival records which are intended to be preserved for decades. Cryptographic mechanisms that work fine in short term become less effective in long term due to issues, such as loss of private key and compromise of the cryptographic algorithms [1]. In addition, they are not generally accepted by international archival community [2]. Thus, there is a need for a method that assesses the trustworthiness of a digital record by looking into the record itself, as well as the evidence (preserved in Evidence-Keeping Metadata) related to it.

Trustworthiness assessment based on Evidence

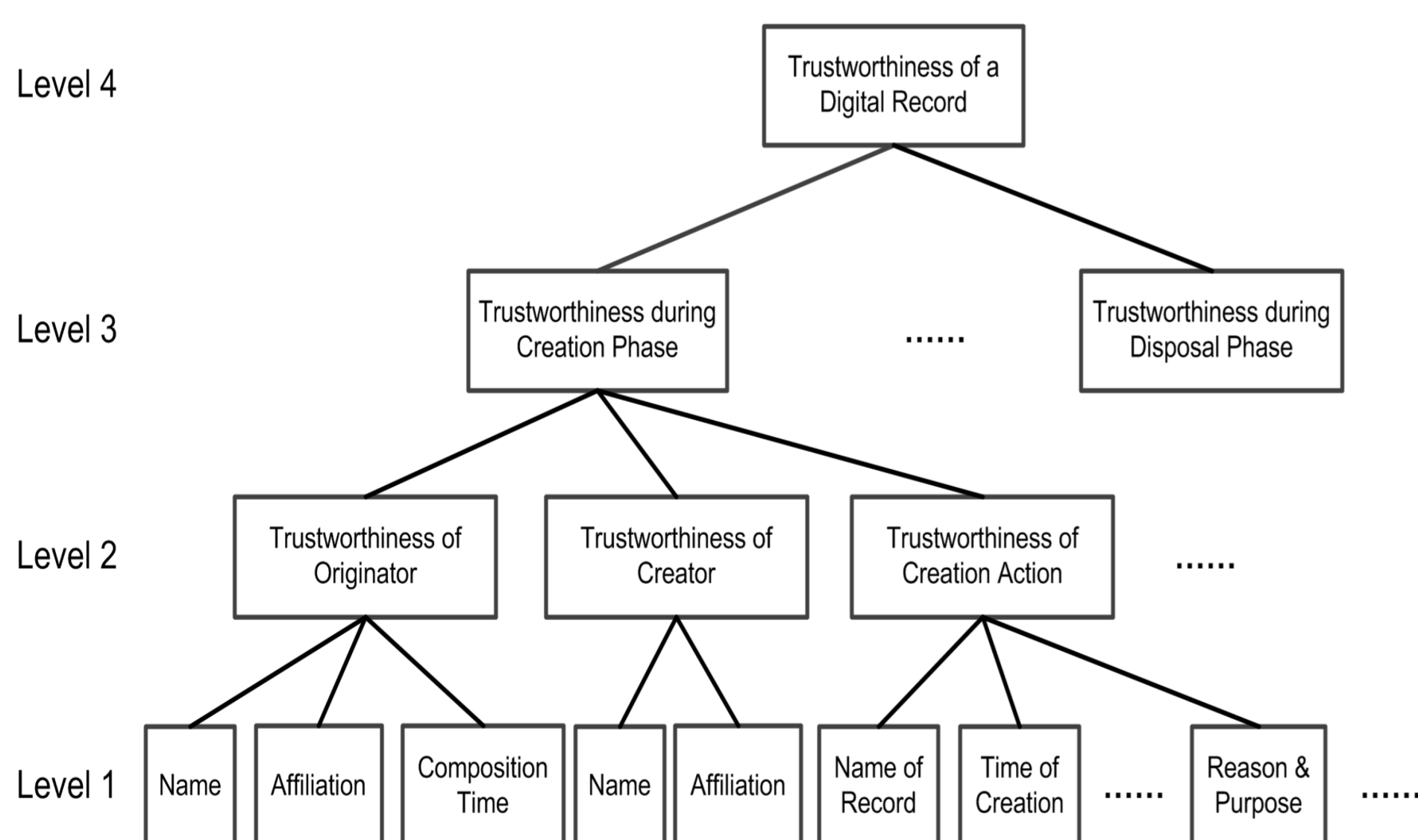


The framework to assess the trustworthiness of digital records



The assessment approach

The trustworthiness of a digital record is built up of trustworthiness during different phases of the record's life cycle, which in turn can be categorised by the trustworthiness of various components. Finally, the trustworthiness of each component is assessed using evidence stored in EKM. After receiving the linguistic evidential values of EKM as well as their "trustworthiness hypotheses" (either trustworthy or untrustworthy) from a panel of experts, the assessment model maps them into basic belief assignments (bbas), and uses these bbas in the Dempster-Shafer theory to assess the trustworthiness of a digital record from the bottom to the top, where the trustworthiness of the record is arrived at.



References

- [1] M. W. Storer, K. M. Greenan, and E. L. Miller, "Long-term threats to secure archives," in The Second ACM Workshop on Storage Security and Survivability (StorageSS'06), 2006, pp. 9–16.
- [2] F. Boudrez, "Digital signatures and electronic records," Archival Science, vol. 7, no. 2, pp. 179–193, 2007.