

LongRec – Records Management over Decades

The primary goal of this joint-industry project is the Persistent, Reliable and Trustworthy Long-Term Archival of Digital Documents, with Emphasis on Availability and Use of Documents. The particular problems addressed by the LongRec project typically emerge when document lifetime exceeds 20 years, and LongRec imposes no upper limit on the lifetime. The main objectives for the LongRec partners are a) to enable transition to digital original documents and digital work processes for information that must be available and in use over decades, and b) to explore the potential for commercial products/services in this area.

Case studies addressed by LongRec include documentation for physical objects that are in use for decades (ships, oilrigs, power plants, and others) and documents in public registries. Results may be generalised to other cases, e.g. health information. LongRec goes beyond the "digital preservation" area addressed by libraries and (public) archives in that documents also need to be used (retrieved, updated, verified) subject to constraints related to ownership and authorisations. All parts of a document's environment (technology, processes, organisations, roles/people, and ownership) must be expected to undergo several changes during the lifetime of the document. LongRec goes beyond state of the art in "records management" by addressing long-term aspects, and preservation not only of availability and readability, but also of semantic value (meaning, context) and evidential value (trustworthiness).

NR's contribution

NR researchers work on the development of the "Preservation of trust and security" of digital original documents that must be trusted over time. This includes confidence in preservation of: Availability (to authorised actors), integrity (correctness), confidentiality (to unauthorised actors), IPR protection (of ownership), and accountability (traceability of actions and events related to the document). These properties are threatened by errors, mistakes and failures, but also by security events (i.e., intentional attacks). NR hosts a PhD fellow in this area specifically the development of theory and methods for the use of evidential value of a record as an index for the degree of trust, and to derive guidelines for preservation of evidential value over time.

Benefit for customers

LongRec provides solutions to overcome limitations regarding the long-term perspective of work processes, both within a company and across company borders, digital processes which are increasingly relying on digital documents. By establishing a scientific knowledge base for handling the long-term perspective, it becomes viable to build products and services for the long-term perspective. By offering trusted, long-term storage services the service provider takes on a great responsibility to provide services for an unknown future. In order to make this a viable business it is essential that LongRec has to be built on sound, scientifically established standards and methods that are also supported by technology, "demonstrating conformity with regulatory or legal constraints."

Benefit for society

The established theory, mechanisms, and technology will enable companies to trust long-term (several decades) storage of digital original documents, and be able to use and update the documents throughout their lifetime, thus strengthening and promoting the understanding of management of long-term digital documents in the educational system, to the academic research community, and to the society at large.

Project results

The exploratory phase focusing on both the obstacles inhibiting the transition to digital work processes and the possibilities and innovation potential that might be exploited after such a transition has been completed. This phase includes case studies for the partners (primarily requirements capture) and establishment of state of the art in related research and in product/service support. Requirements from the partners' environment have also been collected (legal, compliance etc.). The development of the first draft of strategies and guidelines (processes and organization) and specifications (for technical solutions) as a set of publicly available documents has been started.

The LongRec project is the joint-industry project focusing on the challenge of persistent, reliable, and trustworthy long-term storage of digital records, with emphasis on availability and use of information. Problems associated with these aspects typically emerge when document lifetime exceeds 20 years. This 3-year R&D project was supported by the Norwegian Research Council, financing 3 PhD students and one MSc student. LongRec had 5 major focus areas: READ - readability over time, including migration and conversion, FIND -search and retrieval, TRUST – trustworthiness and evidential value, UNDERSTAND – semantics, and COMPLIANCE. Additionally, Cost factors of the information management were addressed as a separate activity.

LongRec goes beyond the "digital preservation" area addressed by libraries and (public) archives, in that information also needs to be used (retrieved, updated, and verified) and is a subject to constraints related to ownership and authorizations. All parts of a record's environment (technology, processes, organizations, roles/people, and ownership) are expected to undergo several changes during the lifetime of the record. Long-term aspects, such as preservation (not only of availability and readability, but also of semantic value, i.e. meaning, context) and evidential value (trustworthiness) are being addressed.

Publications

In the following, we list selected publications.

- [LongRec Final Report](#)
- [Preservation of Trust in Long-Term Records Management Systems](#)
- Jianqiang Ma, Habtamu Abie, Torbjørn Skramstad, and Mads Nygård, A Framework for the Assessment of the Trustworthiness of Digital Records over Time, IEEE ISSR-2011 (Third IEEE International Workshop on Security in e-Science and e-Research), Changsha, China, November 16-18, 2011
- Jianqiang Ma, Habtamu Abie, Torbjørn Skramstad, and Mads Nygård, On Time, Conflict, Weighting and Dependency Aspects of Assessing the Trustworthiness of Digital Records, DEPEND 2011 (The Fourth International Conference on Dependability), August 21-27, 2011 - French Riviera, Nice/Saint Laurent du Var, France
- Jianqiang Ma, Habtamu Abie, Torbjørn Skramstad, and Mads Nygård, Assessment of the Trustworthiness of Digital Records, IFIPTM 2011 5th IFIP WG 11.11 International Conference on Trust Management, June 29 - July 1, 2011, Copenhagen, Denmark
- Jianqiang Ma, Habtamu Abie, Torbjørn Skramstad, and Mads Nygård, Development and validation of requirements for evidential value for assessing trustworthiness of digital records over time, Journal of Information, 2013.
- Jianqiang Ma, Habtamu Abie, Torbjørn Skramstad, and Mads Nygård, Requirements for Evidential Value for the Assessment of the Trustworthiness of Digital Records over Time, IEEE Symposium on Trust, Security and Privacy for Pervasive Applications (TSP) 2009, October 12-14, 2009 in Macau SAR, P.R.China
- Jianqiang Ma, Habtamu Abie, Torbjørn Skramstad, and Mads Nygård, Preservation of Trust and Security in Long-Term Record Management, Sixth Annual Conference on Privacy, Security and Trust, Graduate Student Symposium (PST2008), October 1-3, 2008, Delta Fredericton, New Brunswick, Canada
- Myrseth, P; Gulla, J. A; Haderlein, V; Solskinnsbakk, G; Cerrato, O. Utilizing aging public information. Scandinavian Workshop on e-Government, January 2010
- Luan, F; Nygård, M; Mestl, T. A mathematical framework for modeling and analyzing migration time, in Proceedings of the 10th annual Joint Conference on Digital Libraries. 2010, ACM: Gold Coast, Queensland, Australia. p. 323-332.
- Luan, F; Mestl, T; Nygård, M., "Quality Requirements of Migration Metadata in Long-term Digital Preservation Systems", accepted in 4th Metadata and Semantics Research Conference (MTSR 2010), 20-22 October 2010, Alcalá de Henares, Spain.
- Solskinnsbakk, G; Gulla, J. A; Haderlein, V; Myrseth, P; Cerrato, O. Quality of Subsumption Hierarchies in Ontologies. NLDB 2009. 14th International Conference on Applications of Natural Language to Information Systems
- Gulla, J. A; Solskinnsbakk, G; Haderlein, V; Myrseth, P; Cerrato, O. Semantic Drift in Ontologies. WEBIST 2010 - International Conference on Web Information Systems.
- Nattiya Kanhabua and Kjetil Nørvåg, Improving Temporal Language Models For Determining Time of Non-Timestamped Documents, Proceedings of the 12th European Conference on Research and Advanced Technology for Digital Libraries 2008 (ECDL'2008), Aarhus, Denmark, September 2008.
- Nattiya Kanhabua and Kjetil Nørvåg, Using Temporal Language Models for Document Dating (demo paper), Proceedings of the European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML PKDD'2009), Bled, Slovenia, September 2009.
- Nattiya Kanhabua and Kjetil Nørvåg, Exploiting Timebased Synonyms in Searching Document Archives, Proceedings of JCDL'2010, Brisbane, Australia, June 2010.
- Nattiya Kanhabua and Kjetil Nørvåg, Determining Time of Queries for Re-ranking Search Results, Proceedings of ECDL'2010, Glasgow, Scotland, UK, September 2010.
- Nattiya Kanhabua and Kjetil Nørvåg, QUEST: Query Expansion using Synonyms over Time (demo paper), Proceedings of the European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML PKDD'2010), Barcelona, Spain, September 2010
- Mestl, T; Cerato, O; Ølnes, J; Myrseth, P; Gustavsen, I. (2009) Time Challenges - Challenging Times for Future Information Search. Dlib-magazine May/June 2009 Vol. 15 No. 5/6, ISSN: 1082-9873



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Research areas

- › [Information Security](#)

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Partners

- › [Norwegian Computing Center \(Norsk Regnesentral\)](#)
- › [Det Norske Veritas AS](#)
- › [BBS](#)
- › [Fast Search & Transfer](#)
- › [CSAM International](#)
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