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Knowledge Management: High Energy Physics as Model Case

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The world-wide High Energy Physics (HEP) community has emerged as one of the major forces in developing new tools and concepts to enhance the overall quality of knowledge management and to support technological innovation in this field. Though joint research and academic activities in HEP represent a more than 50-years old tradition, collaboration in this field has changed over the decades. In coming years, bigger and more distributed than ever before collaborations, with several thousand physicists and engineers, will concentrate on fewer major HEP experiments. They will face unprecedented challenges to accomplish their work at the leading laboratories where large accelerators are being constructed. These challenges arise primarily from the rapidly increasing size and complexity of datasets to be collected and the enormous computational, storage and networking resources to be deployed by global collaborations in order to process, distribute and analyze information.

During the last two decades, the Web was HEP community response to the new wave of scientific collaborations. Almost all data networking in the HEP community is today based on the Internet which has since grown into a global information highway. Currently, HEP community needs to attempt to progress beyond structure information towards automated knowledge management of scientific data which requires extremely capable computing infrastructures supporting several key areas. Together with computer scientists, HEP community recognised as a driving force, is extremely well positioned to continue this successful strategy with respect to the initiative to build "the next generation internet". Facing knowledge sharing, acquisition and organisation growing requirement, HEP scientists invented the preprint concept in order to facilitate and speed up access to the ongoing research development and results. Preprint archive has since become a global repository for research particularly in physics, mathematics and computer science. Lessons that will be valuable in establishing guidelines for more efficient knowledge management are drawn from this experience.