

A tale of two programs: driving innovation in HEP computing

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In spite of the fact that HEP computing has evolved considerably over the years, the understanding of the evolution process seems to be still incomplete. There is no clear procedure to replace an established product with a new one, and most of the successful major transitions (e.g. PAW to Root or Geant3 to Geant4) have involved a large dose of serendipity and have caused splits in the community, while many other attempts have failed. In general, software innovation has proceeded with a relatively low efficiency, in an environment that is moreover already lacking sufficient resources for code development. The accelerating pace of evolution of the hardware and of the algorithms is certainly good news, since it offers the opportunity to address HEP dire need of computing resources, but only if the innovation process is able to take advantage of it in a timely and efficient way. One case in point is the evolution of the simulation code, responsible for 50% of the total computing resource consumption. This talk will describe the history of the GEANTV project, aimed at designing the next generation of simulation codes. In particular, we will describe how the concept of “disruptive innovation” has been adapted to our environment and how it has successfully led to the development of a revolutionary simulation prototype while continuously feeding technological innovation into the existing product. This process, begun with a no-compromise extreme design, has now led to the seamless merging of the development activities into the main line, hopefully leading to a seamless and efficient transition.

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