

1116-00-2335      **Edgardo Cheb-Terrab\***, ecterrab@maplesoft.com, and **Laurent Bernardin**. *30 Years of Digitizing Mathematical Knowledge with Maple*.

We will talk about lessons learned and progress made over 30 years of encoding mathematical knowledge within the Maple system. A wealth of information is now readily available to query and compute with.

In particular, we will highlight two examples. First, our effort to digitize and encode into Maple, Exact Solutions of Einstein's Field Equations, a book representing knowledge about known solutions of Einstein's field equations. Three main challenges have arisen: 1) how to digitize this monumental piece of information, 2) how to frame this information such that we can take full advantage of it, and 3) how to define metadata to make the encoded knowledge computable.

The second example is about the Maple digital library of mathematical functions, which consists of a repository of knowledge on identities and properties of mathematical functions following the NIST Digital Library of mathematical Functions, again combined with the ability to, on demand, generate additional identities by algorithmic deduction from the available knowledge base. In addition to challenges on digitizing and encoding, query methods to provide effective ways for a mathematician to navigate and utilize this body of digital knowledge, turn out to be crucial. (Received September 22, 2015)