Why SciViews?

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Part I
Introduction

There are several office suites, including (at least) a word processor, a spread-sheet, a slideshow presentation program, and tools to draw pictures and write mathematic equations. Microsoft Office and OpenOffice seem to fulfill the needs of most users. Son why should a *scientific* user need a different suite for his work? Well, we believe that those general purpose office suites are not well adapted for scientists. They need something radically different. The SciViews Scientific Suite aims to provide those tools to them. In short:

▷ The spreadsheet paradigm is very popular to do calculations and graphs on tabulated data. However, there are many reasons why this paradigm is not efficient, error-prone and barely fits the needs for more serious data analysis, as most scientists need. We believe that R, together with a carefully ciseled GUI is a much more adequate general purpose calculation and plotting engine. That is why the SciViews Scientific Suite is build around R, and reserves so little space to a spreadsheet program.

▷ The Word Processor and its WYSIWYG[1] paradigm makes a poor document preparation environment for scientific literature like papers and books. Scientific literature is highly structured text and it does not fit well with the loose presentation of text elements in a WYSIWYG program. Also, Word Processors tend to be relatively poor and inefficient in mathematic formula typesetting and in bibliographic references formatting. LaTeX text processing system is much, much more adequate, but it requires to "program" your text, and not all scientists are ready to take that way. A good alternative is the WYSIWIM paradigm of LyX. WYSIWIM stands for "What You See Is What You Mean". Here, you don't see the code hidden in you rich text formatted document, but you don't see the final result either. You see, instead, a very suggestive representation of the *structure* of your text (titles, paragraphs, equations, etc.). You can then concentrate on both the content and the structure, and delegate to the very capable LaTeX system that LyX uses to typeset its documents on the background to produce the final result. That WYSIWIM approach,

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[1]WYSIWYG = What You See Is What You Get.

together with the possibility to include results, tables and graphs from R computations directly in the L$_Y$X document using the **Sweave** mechanism makes is a very suitable alternative to more traditional Word Processing programs for scientists.

▷ The WYSIWYG slideshow programs, like PowerPoint, are not well suitable for scientists for the same reasons (mainly, a lack of correct formula typesetting and the inability to include code to produce calculation results, tables or graphs directly in the presentation). Here, we go back to L$_Y$X and Sweave again, but together with the excellent **Beamer** L^AT_EX package.

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1   Processing data, analyzing data

Scientist study facts, and they mostly convert these facts into numbers by mean of measurements in a given context (observation or experiment). They, then, manipulate these numbers in different ways...