

# 1 The Philosophy of LyX

“Uncle Cosmo, why do they call this a word processor?”

“It’s simple, Skyler. You’ve seen what food processors do to food, right?”

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*(Jeff MacNelly in “Shoe”)*

## 1.1 What is LyX?

LyX is a document preparation system. It excels at letting you create complex technical and scientific articles with mathematics, cross-references, bibliographies, indices, etc. It is very good at documents of any length in which the usual processing abilities are required: automatic sectioning and pagination, spellchecking, and so forth. It can also be used to write a letter to your mom, though granted, there are probably simpler programs available for that. It is definitely not the best tool for creating banners, flyers, or advertisements (we’ll explain why later), though with some effort all these can be done, too. Some examples of what it is used for: memos, letters, dissertations and theses, lecture notes, seminar notebooks, conference proceedings, software documentation, books (on PostgreSQL, remote sensing, cryptology, fictional novels, poetry, and even a children’s book or two), articles in refereed scientific journals, scripts for plays and movies, business proposals . . . you get the idea.

LyX is a program that provides a modern approach to writing documents with a computer by using a markup language paradigm, an approach that breaks with the obsolete tradition of the “typewriter concept.” It is designed for authors who want professional output quickly with a minimum of effort without becoming specialists in typesetting. The job of typesetting is done mostly by the computer, not the author; with LyX, the author can concentrate on the contents of her writing.

Part of the initial challenge of using LyX comes from the change in thinking that you, the user, must make. At one time, all we had for creating documents were typewriters, so we all learned certain tricks to get around their limitations. Underlining, which is little more than overstriking with the “\_” character, became a way to emphasize text. You were forced to figure out column sizes and tab stops, and set them, before creating a table. The same applied for letters and other right justified text. Hyphenation at the end of a line required a careful eye and a lot of foresight.

In other words, we’ve all been trained to worry about the little details of which character goes where. Consequently, almost all word processors have this mentality. They still use tab stops for adding whitespace. You still need to worry about exactly where on the page something will appear. Emphasizing text means changing a font, similar to changing the typewriter wheel. This is the underlying philosophy of a WYSI-

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WYG word processor: “What You See Is What You Get”. Unfortunately, that paradigm often results in “What You See Is All You Get”.

This is where L<sub>Y</sub>X differs from an ordinary word processor. You don’t concern yourself with what character goes where. You tell L<sub>Y</sub>X *what you’re doing* and L<sub>Y</sub>X takes care of the rest, following a set of rules called a *style*.<sup>1</sup> Let’s look at a little example:

Suppose you are writing a report. To begin your report, you want a section called “Introduction.” So, you go into whatever menu it is in your word processor that changes font sizes and decide on a new font size. Then you turn on bold face. Then you type, “1. Introduction”. Of course, if you later decide that this section belongs someplace else in the document, or if you insert a new section before it, you need to change the numbering for this and all following sections, as well as any entry in the table of contents.

In L<sub>Y</sub>X, you go to the pull-down on the far left of the button bar and select *Section*, and type “Introduction.”

Yes, that’s all. If you cut and paste the section, it will automatically be renumbered—everywhere. And if you enter references to that section correctly (by inserting cross-reference tags), L<sub>Y</sub>X will automatically update them all throughout the file so that you never, ever type a section number.

Now let’s look at the problem of consistency. Five days later, you reopen your report and start Section 4. However, you forget that you were using 18 pt bold instead of 16 pt, so you type in the heading for Section 4 in a different font that what you used for Section 1. That problem doesn’t even exist in L<sub>Y</sub>X. The computer takes care of all that silly bookkeeping about which thing has what size font, not you. After all, that’s what a computer is good at.

Here’s another example. Suppose you’re making a list. In other word processors, a list is just a bunch of tab stops and newlines. You need to figure out where to put the label for each list item, what that label should be, how many blank lines to put between each item, and so on. Under L<sub>Y</sub>X, you have only two concerns: what kind of list is this, and what do I want to put in it. That’s it.

So, the basic idea behind L<sub>Y</sub>X is: specify *what* you’re doing, not *how* to do it. Instead of “What You See Is What You Get,” the L<sub>Y</sub>X model is “What You See Is What You Mean” or “WYSIWYM.” It’s a powerful idea that greatly simplifies the mechanics of writing documents. This is also why L<sub>Y</sub>X isn’t so good for creating posters and flyers—in this case, you *do* want to specify exactly where everything goes, because there are no functional units like paragraphs, sections, etc. This doesn’t mean L<sub>Y</sub>X is missing some cool function. It simply means that it isn’t the right tool for the job—you don’t use a screwdriver to drive in nails (unless your screwdriver comes with a lifetime warranty).

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<sup>1</sup> To be fair, most recent versions of the most popular office suites now have some sort of style sheets which follow a similar markup method. However, our experience is that they are still rarely used in practice.

## 1.2 Differences between LyX and Other Word Processors<sup>2</sup>

Here's a list of things you won't find in LyX:

- The document ruler
- Tab stops
- Extra whitespace (i. e. hitting *Enter* or *Space* two or more times)

Tab stops, along with a ruler showing you the position of things on the page, are useless in LyX. The program worries about where things go on the page, not you. Extra whitespace is similar; LyX adds them where necessary, depending on context. Not being able to type two blank lines in a row will be annoying at first, but it makes more sense once you're thinking in WYSIWYM terms.

Here are some things that exist in LyX, but aren't used as you might think:

- Indenting controls
- Page breaks
- Line spacing (i. e. single spaced, double spaced, etc.)
- Whitespace, horizontal and vertical
- Fonts and font sizes
- Typefaces (bold, italic, underline, etc.)

Although they exist in LyX, you generally don't need them. LyX will take care of these things for you, depending on what you're doing. Different parts of the document are automatically set in a different typeface and font size. Paragraph indenting is context dependent; different types of paragraphs get indented differently. Page breaks get handled automatically, as well. In general, the space between lines, between words, and between paragraphs is variable, set by LyX.<sup>3</sup>

Lastly, there are a few areas where we believe LyX (and L<sup>A</sup>T<sub>E</sub>X) surpasses many word processors:

- Hyphenation
- Lists of any type
- Mathematics

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<sup>2</sup> No, we're not trying to start (or win) a word processor holy war here. But we do think it's important to describe LyX's features. And one of LyX's main features, WYSIWYM, is a fundamentally different concept than the one that most of people have about word processing.

<sup>3</sup> There are ways to adjust all of these (only some of which require knowledge of L<sup>A</sup>T<sub>E</sub>X), either for a whole document or for a specific location in a document. See the *User's Guide* and/or the *Extended Features* manual for details.

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- Tables
- Cross-referencing

Granted, many modern word processors can handle mathematical symbols, tables, and hyphenation, and many have moved towards style definitions and the WYSIWYM concept. However, they've only recently been able to do so, whereas L<sub>Y</sub>X is built upon the L<sub>A</sub>T<sub>E</sub>X document preparation system. L<sub>A</sub>T<sub>E</sub>X has been around for over 15 years, and *works*.