

The W95 environment

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Abstract

Since 1992 'WORKSHOP 9x' has taken place at the Czech Technical University (CTU) each year. The aim of this broadly-based seminar is to give all CTU researchers and research teams an opportunity to present their research projects in twenty minutes of spoken presentation and two pages of seminar proceedings. I have dealt with the technical problem of making the proceedings using LATEX. As the number of contributions has increased year by year and the time for making the book is limited, some automation of the typesetting process was and still is necessary. W94 and W95 are attempts to transfer part of the typesetting work from the final typesetter to the authors. W9x is a simple single-purpose user-interface between LATEX and the MS-DOS user, who may know nothing about TEX and LATEX. Some experience (both technical and psychological) of using this system in the two last years is discussed in this paper and may be useful for organizers of seminars, conferences etc. where contributors are not TEX users and the proceedings are to be made with TEX.

1 Introduction – the history

The Czech Republic has passed through a great political, economic and social transformation process in the last five years. Of course, great changes have also affected the CTU in Prague. The old system of state support for education and research, based on long-term central planning has changed into a grant system based on competition between research projects. At present, 607 research and educational projects are supported by grants from various Czech and foreign grant agencies.

More and more projects have brought more and more need for publishing the results of research work. In 1991, the first ideas of establishing an annual broadly-based university seminar – Workshop 9x – appeared at the CTU. Workshop 92 was the first in the series and took place at the CTU in January 1992 and subsequent Workshops have been held regularly every year. The seminar gives an opportunity to present research projects in spoken form (20 minutes) and in two pages of proceedings.

In 1991, I was given a job at the CTU Computing Centre, where a small group of young people working with TEX was set up. The Centre was asked to co-operate with

the Workshop 92 organizing committee and the small group to make the proceedings with \LaTeX .

As the conditions have changed rapidly year by year (see Table 1), it has been necessary to find and improve our methods of work. Our experience is described in the following sections.

Year	Number of contributions	Number of pages	Number of typesetters	Time for completion	pg/man per day
	Method of work				
1992	210	484	4	30 days	4.03
	Manual conversion from text editor				
1993	293	662	3	30 days	7.35
	Conversion from text editor, partially automated				
1994	303	688	2	20 days	17.2
	W94 Environment				
1995	436	928	2	15 days	30.9
	W95 Environment				

Table 1: Conditions, elapsed time and methods of work

1.1 1992 – no experience, great confusion...

A desperate situation... In 1991 someone announces a seminar for which contributions are to be word processed. Even this fact was quite a shock for many people at a time when PC 386 SX was a great hit for a small number of lucky people. Many department offices still preferred typewriters and many people were still starting to learn how to use a personal computer. Most computers were XT's and 286s.

Authors were asked to prepare their contributions with the simple text editor Text602, which is a WordStar-type editor without mathematical fonts. Mathematical equations were therefore written by hand into empty spaces in the text and camera-ready figures were enclosed. The organizing committee collected all contributions (diskettes, Text602 prints and enclosures) and this complete pile of papers was given to us. First we made a \LaTeX style file and started to convert ASCII text files into the source form that \LaTeX needs. Reading and typesetting mathematical formulas was particularly hard work. Very often it was impossible to find out what the formula should have been and it was necessary to consult with the authors (by phone or in person).

As we had no experience we did not know how to organize our work, how to sort the contributions, where and how to store the ready prints and files, how to divide the work optimally among a number of people, etc., etc. Due to these problems we were very short of typographic time and so the final typographic standard of the proceedings

was low, though much higher than it would have been in the case of direct processing of the Text602 prints. The proceedings were therefore well received.

1.2 1993 – first rules of the game

A year later I became the leading typesetter in our group and also a member of the organizing committee of Workshop 93. I had to bear all the responsibility for making the proceedings. My situation was a bit easier as I had about six months in which to prepare all the strategy.

I started by analyzing the previous year's proceedings, and I found the structure of all the contributions quite similar. At that time I got the idea to turn this similarity into an identity of structure, to set up an obligatory structure for contributions. I supposed that text files of this obligatory structure could be pre-processed with some tool (a short Pascal program). I wrote this tool to read data from some known parts of the file and to add some formatting commands to them. I anticipated that this would save much typesetting time.

This involved telling authors (very exactly) what and in which way I wanted them to write. So I wrote detailed 'Instructions for Authors' in which the following sentences appeared:

'The first line of your text file should contain the title of your article. Use all upper-case letters. Then leave one blank line. The next line should contain the initial letter of your first name, a point, one space and your surname. Then leave a line again. Then... etc., etc.' These detailed instructions were intended to ensure the output uniformity of all articles in the proceedings.

The output should have looked something like Figure 1. Seven obligatory parts can be seen in this fictitious example of an article:

- the title
- names of the authors
- addresses of the authors
- key words
- main article body
- references
- information about grant support

This structure became a standard not only for Workshop 93 but also for subsequent years. This is the basis from which the idea of the W94 and W95 environment has grown, as we will see in the following sections.

In 1993 the processing was much easier than it had been a year before, though not everything went according to my plans. The problem was that most authors did not follow my instructions exactly. This led to the fact that most files could not be pre-processed directly.

All the file-by-file processing had the following stages:

WORKSHOP 93

MATHEMATICS

THE TITLE OF THE ARTICLE

J. Hora, A. Strejc*

CTU, Fac. of Electrical Eng., Dept. of Computers
Karlovo nam. 13, 120 00 Praha 2
*CTU, Computing Centre
Zíkova 4, 166 35 Praha 6

Key words: article, example

This is the main body of the article that should have the form of an extended abstract not exceeding two pages. No sectioning is allowed.

$$a^2 = \sqrt{c^2 - b^2}$$

It can contain mathematical formulas and space left for figures.

References:

[1] KNUTH, D. E.: *The TeXBook*. Addison-Wesley, 1991.

This research has been conducted at the Department of Computers and has been supported by CTU grant No. 1234.

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Figure 1: A fictitious Workshop contribution

1. checking the incoming files and editing them to get the exact form for pre-processing
2. pre-processing with a specially written tool
3. \LaTeX typesetting itself, i.e. editing/ \LaTeX compiling/viewing the pre-processed file until the definitive output form.

The results were not bad. As can be seen in Table 1, fewer people were needed to process more contributions than in 1992. Indirectly, the typographic level of the proceedings was higher because more time was spent on actual typesetting. The proceedings were received very well. All this filled me with the feeling that the method was right but that more steps would have to be taken to make the process more automated and to keep the idea alive in the case of even more contributions. One more fact can be seen in Table 1. The number of team members decreases year by year. Some people have left and some are still leaving the University for better conditions offered in the private sector of the economy...

1.3 1994, 1995 – the environment is in action

More exactly, the child was born in 1993, several months after the Workshop 93 seminar. 1994 was the year of the Workshop 94 seminar and the first use of the W94 Environment. I will not write about this system in detail here but will describe only the improved version W95 in the text that follows.

Experience from the previous year had led me to the following opinions:

- the idea of central \LaTeX processing non- \LaTeX contributions is vital, and this method leads to a higher typographic standard of the proceedings that cannot be reached by simple camera-processing
- an obligatory structure for contributions (Figure 1) is good for this special purpose and there is no need to change it
- in the case of an obligatory structure the user-interface can be written to collect part of the data in a user-friendly manner and convert it automatically into \LaTeX source code.

2 The W95 environment

The whole system can be divided into two basic parts, as follows:

1. a very reduced installation of em \TeX (as minimal as possible) as a kernel of the system
2. a user-friendly interface based on the menu system controlling all the operations concerned with writing the article, i.e. collecting the data, and running all necessary applications (editor, \TeX , dvi-drivers, packing programs etc.)

It was not difficult to deal with the kernel of the system. The following elements of a usual \TeX installation were taken:

- \TeX compiler (em \TeX version 3.141)
- the `latex fmt` format file
- Mattes dvi-drivers version 1.5a (`dviscr`, `dvihpj`)
- only the necessary fonts (in 300 dpi) that can appear in the article for both the screen previewer and laser printer

The main goal was to write Pascal program `w95.exe` – the interface. It has two basic kinds of functions – to collect user data and to run applications working with it.

Figure 2 shows the structure of the whole system. Here `arj.exe` is used as a packer/unpacker of user data, `keybcs2.com` is a resident keyboard driver, `dbedit.com` is an ASCII text editor, `*.bats` are batch files running \TeX , screen previewer (`dviscr`) and laser printer driver (`dvihpj`) respectively, `USER DATA` is all data concerning the logged user and `COMMON DATA` is all data common to all users (helps, examples, bases, address lists etc.)

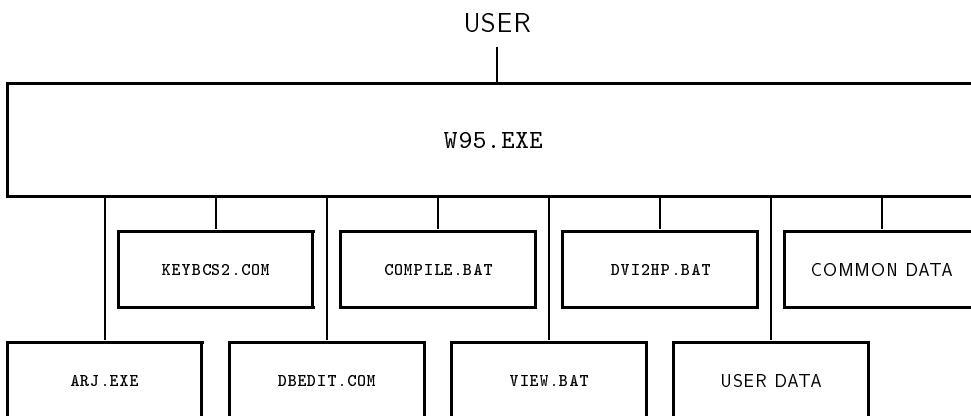


Figure 2: The W95 general structure

2.1 User data

As was explained above, we can divide each Workshop article into seven parts. Six of them (all except the body of the article) correspond to files: `title.bin`, `authors.bin`, `address.bin`, `keywords.bin`, `refer.bin` and `this_res.txt`. The first five are binary files (Pascal records) keeping information about the title, authors etc., the sixth file is a text file storing the final paragraph, which begins with the words 'This research...' and contains information about grant support (see Figure 1).

The seventh part of the article – the article body – is the most complex part. It consists of one or more files that contain subparts (let us call them 'blocks') of the body of the article. These files have user-specified names with one of the eight valid extensions (`.txt`, `.equ`, `.dis`, `.eqa`, `.lst`, `.fig`, `.2fi` or `.tab`). Here the extensions

specify the 'type of block' i.e. what type of information the block contains. The block types will be described later.

The last file, which is accounted as a user data file, is `body_map.bin`. This is a very important file that says what blocks are defined (it keeps their filenames), which of them are 'active' i.e. which should be included in the body of the article) and the order in which the blocks are to be taken.

2.2 Logging into W95 – unpacking user data

W95 is a multi-user system, i.e. it can store the user data of more than one user. When it is started it asks you for your `username` (if you are a new user you can choose a name). Each user has all his user data stored in a file called `username.arj`. After logging as `username` ARJ unpacks the user data (Figure 3) and puts it into the working subdirectory.

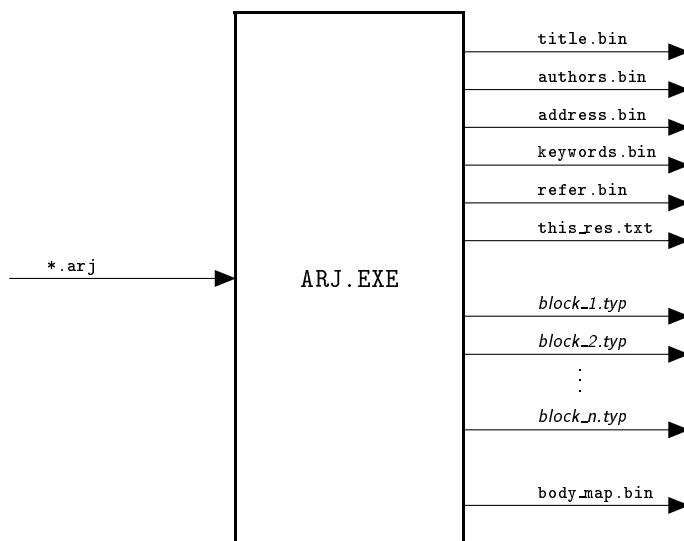


Figure 3: Unpacking the user data

2.3 Editing user data

All binary user data files (6 files `*.bin`) are edited directly within the W95 menu system. The file `this_res.txt` and all blocks are edited using the built-in text editor. All these operations are done through the W95 main menu by selecting the proper item. Since binary data consists of Pascal records of constant length, some limitations of data size must be given (e.g. a maximum of 4 lines of title, 12 authors, 4 addresses etc.). Editing these things is very easy and user-friendly. As for addresses, the complete list of all CTU

faculty names, department names and locations is part of the menu system. This kills two birds with one stone: it saves typing time and guarantees error-free and uniform structure of the addresses.

The body of the article can be edited block by block. The number of blocks can be from 0 (theoretically) to 16. People who are accustomed to writing in \TeX or \LaTeX will probably write everything in a single block without problems. Making more blocks is better for those who know little or nothing about the system. The following section tells you more about blocks.

2.4 The philosophy of blocks

A user of W95 may or may not be familiar with \LaTeX . This is the fundamental problem I had to solve. The idea of blocks as elements of the article body seemed to be a solution. A \LaTeX user just opens one block and writes the body of his article in \LaTeX without any problem, because he knows \LaTeX . Someone who is not familiar with these things will create the body of his article in the following way:

1. The user divides his article into several ‘homogeneous’ parts. He will write each part separately in a block of corresponding type. W95 offers the following block types:
 - **TXT** for writing a piece of plain text
 - **LST** for lists
 - **DIS** for equations without number
 - **EQU** for numbered equations
 - **EQA** for equation arrays
 - **TAB** for tables
 - **FIG** for figures ‘per extension’
 - **2FI** for a pair of figures
2. He opens a block. This means that he runs the editor that opens a text file called *name.typ* where *name* is the user-defined name of a block and *.typ* is an extension specifying the block type.
3. Though the opened file is new it is not empty, since it is prepared for writing appropriate things. For example if the file **.equ* is opened, one can see the lines `\begin{equation}` and `\end{equation}` and more commentary lines with instructions on how to type equations. This is like a context help, but here helps are parts of files so no special keys for their activation are necessary.
4. Swapping to a file with examples concerning the proper block type is available after pressing a hot key. The editor makes it possible to copy these examples into the user’s block. So all examples can be \LaTeX ed and the user can compare their source form with the screen output. This can be considered as a quick tutorial (I took this idea from the Borland Turbo Pascal environment).
5. When a block is ready it can be ‘turned off’ and the next one can be dealt with. So the blocks can be \LaTeX ed either separately or together, or any subset of them can

be taken. In this way the user can, for example, create text parts in the first stage, then all equations etc.

Generally, the philosophy is based on a fact that is well-known from programming. You may write simple programs before you become a real programmer. Indeed, you may write programs and never become a programmer. Similarly, you may write an article in L^AT_EX and never become a L^AT_EX user. If you have good helps and ready examples and an average I.Q. you should be able to create the correct L^AT_EX input. You certainly do not need to learn all the L^AT_EX commands. Only a little subset of them and a few specially defined macros are necessary for writing the article. The philosophy of L^AT_EX is to reduce the great number of T_EX commands and provide macros for several document styles. Only one style is needed for the Workshop article. The obligatory article structure is given. Therefore a next-step reduction of L^AT_EX commands can be performed.

2.5 Pre-processing user data

Pre-processing is always done automatically when the 'Compile' function is called from the W95 main menu and it is followed immediately by the L^AT_EX compilation. In the stage of pre-processing a compact input file called `article.tex` is generated from the various-format user data.

1. A standard preamble is generated.
2. Binary data from `title.bin`, `authors.bin`, `address.bin` and `keywords.bin` are transformed into parameters of special defined macros `\title{...}`, `\authors{...}` etc.
3. Blocks that are set 'active' are appended to `article.tex`. Filenames of all blocks and their activity flags are stored in `body_map.bin`.
4. Binary data from `refer.bin` are transferred into parameters of specially defined macros `\refitem{...}` generating a list of references.
5. The final paragraph `this_res.txt` is appended to `article.tex`
6. The `\en` macro is generated (end of article).

Let us come back to Figure 1. This is the example article. Figure 4 now shows the appropriate input file `article.tex` as a result of W95 pre-processing.

2.6 Other operations

L^AT_EX compilation, previewing and printing the article are standard functions of all T_EX installations and there is no need to describe them here.

Other functions are saving user data, copying the `article.tex` file to diskette and exiting the environment.

```

\documentstyle[12pt,w95]{book}
\pagestyle{wpage}
\nofiles
\beg

\titl
{THE TITLE OF THE ARTICLE}
{}
{}
{}

\authors
{J. Hora, A. Strejc*}
{}
{}

\addresses
{{}CTU, Fac. of Electrical Eng.,
 Dept. of Computers}
{Karlovo nám 13, 120 00 Praha 2}
{{}*CTU, Computing Centre,
}
{Zikova 4, 166 35 Praha 6}
{}{}
{}{}

\keywords
{article,
example}

This is the main body of the article that should have the form of an
extended abstract not exceeding two pages. No sectioning is allowed.

\begin{displaymath}
a^2=\sqrt{c^2-b^2}
\end{displaymath}

It can contain mathematical formulas and space left for figures.

\references
\refitem
{KNUTH, D. E.:}
{The \TeX Book.}
{Addison--Wesley, 1991.}

\vspace{4mm}
\noindent This research has been conducted at the Department of
Computers and has been supported by CTU grant No.~1234.

\end

```

Figure 4: Example of `article.tex`

3 Experience of using W95

This section is about processing the proceedings of the most recent Workshop. I prepared the W95 installation packet consisting of an installation program, the packed W95 system and a 'readme' file in Czech. The size of the packet was about 1 Mbyte. I uploaded it on our ftp archive and prepared installation diskettes for people not familiar with ftp or not connected to the network.

A hotline number and e-mail address were announced where any problems could be consulted. Both were often used and many authors received quick hints from me.

The results were very good. Only a few typographic corrections had to be made and many contributions were error-free. This fact allowed us to process such a great number of contributions within 15 days (Table 1).

3.1 Psychological problems

While writing W95 I realized this operation could be quite dangerous and I was sure some people would be against it. In the event, many people did not like W95 but they succeeded in writing their contributions very well. I received only two letters strongly rejecting W95. Most opponents changed their opinion when they received the ready proceedings. Everybody appreciated the typographic level of the proceedings.

Here are some fundamental negative statements that everyone must expect if preparing such a Workshop.

1. Why must I use W95? I have my WordPerfect (or something else) and I want to use it. And you should convert it into your \TeX ...
2. W95 is based on \TeX and nobody will make me study this terrible system (i.e. \TeX).
3. I do not have time to install W95 and to study your instructions.

All these arguments were very awkward for me. I tried to explain to those people that it would be impossible for me to convert more than 400 contributions from various tools. I explained that we wanted the proceedings in \TeX and not a camera-processed patchwork. I explained that nobody needed to know \LaTeX or \TeX and nobody would have to learn it. I myself installed W95 in the computers of those people who 'did not have time' (the installation takes about 20 seconds) and showed them how to work with it.

I can add that one very positive result also occurred. Some people found the way from W95 to 'full' \LaTeX and \TeX and have become regular users of these systems.

4 Conclusions

This is some advice for organizers of similar seminars who would like to follow the described way of processing the proceedings in \TeX and for \TeX -typesetters who would like to participate in such work.

1. Dealing with the idea on such an environment is possible only if an obligatory (or at least very similar) structure of contributions is given.
2. Close cooperation between the organizing committee and typesetters is necessary. The best results can be obtained if one typesetter (head of the team) is a member of the committee.
3. General information and instructions should be announced at least six months before the deadline. The environment installation packet must be available to all authors at least two months before the deadline.
4. All necessary helps must be part of the program. On the other hand helps must not be too detailed for psychological reasons. People do not have time to study excessively long helps.
5. During the time when contributions are being written, a hotline and hot e-mail must be available for authors. It is often more efficient to make a call and get a quick answer than to search in helps or manuals.
6. Personal consultations are a good method for people in trouble who are not far from the typographic center. Expect about 1–2% of all authors to be helped in person.
7. The organizing committee must collect all contributions and decide the order in which they are to be included in the final book. Then (and not earlier) the complete pile of contributions is to be transported to the typographic center. Any other channels from authors to typesetters must be strictly forbidden.
8. Expect most negative statements just after the announcement of the seminar. The number will decrease slightly after installations and after getting familiar with the environment, and it will fall almost to zero when authors receive the proceedings.