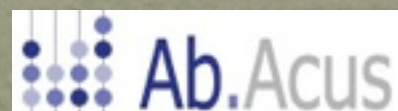


PRODUCING ACCESSIBLE SLIDE PRESENTATIONS FOR SCIENTIFIC LECTURES: A CASE STUDY FOR THE ITALIAN UNIVERSITY IN THE MAC OS X ENVIRONMENT

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INTRODUCTION

- I've been helping blind students for years
 - making accessible study material out of what teachers give them
- Why not a university support service?
 - too slow
 - they lack some competences for adapting advanced scientific contents for blinds
 - lack of full time personnel

WHY NOT THE UNIVERSITY SUPPORT SERVICES?

- Contracts take too long to be signed (1 or more months)
- Students are not followed by the same person through their studies

WHY MAC OS X

- Market share: 10% (increasing)
- Widely spread and increasing in the academic environment
- Much more stable than Windows machines and much more user-friendly than Linux computers
- My PC died and finally bought a Mac (one of the best deal of my working life :))

THE STUDENT'S REQUIREMENTS

- Course: "Multimedia Systems" for the Computer Science Faculty, Università degli Studi di Urbino, Italy
- Transforming a set of PDF of PowerPoint slides full of inaccessible mathematical expressions (inserted with an old version of Equation Editor) into a set of RTF files with the math formulae transcribed in LaTeX

EASY...

- If I had some PPT files, I would have
 - copied and pasted all the text into a RTF file
 - opened the formulae in MathType and converted them to LaTeX
 - and then pasted the LaTeX into the RTF file.

...NOT THAT MUCH!

- Unfortunately I had PDF files

LOOKING FOR GUIDELINES

- @Science Guidelines: no reference to the Mac Environment
- WebAIM: "PowerPoint Accessibility"
- Literature about producing accessible math content

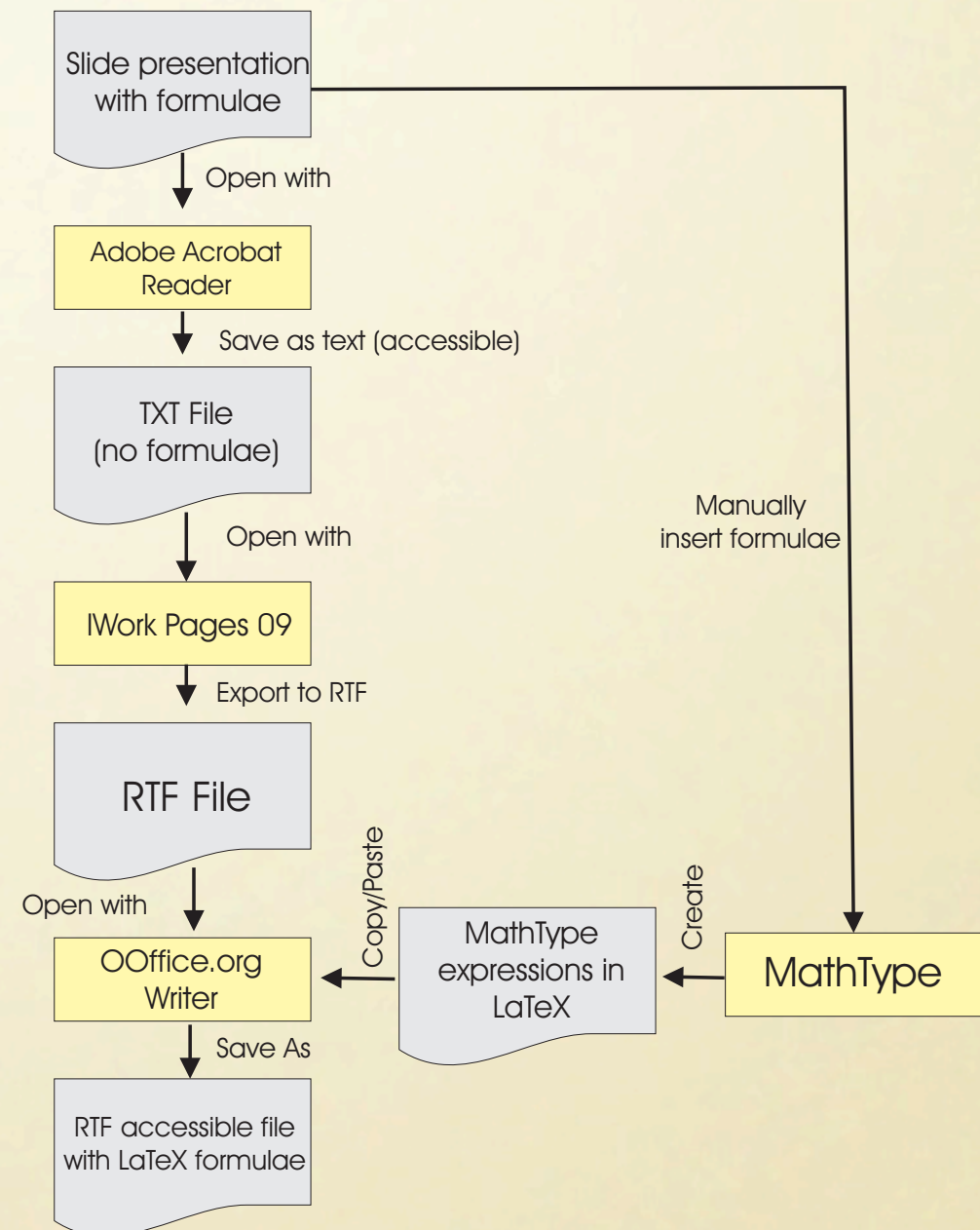


- But I found nothing that fitted my requirements

THE WORKFLOW

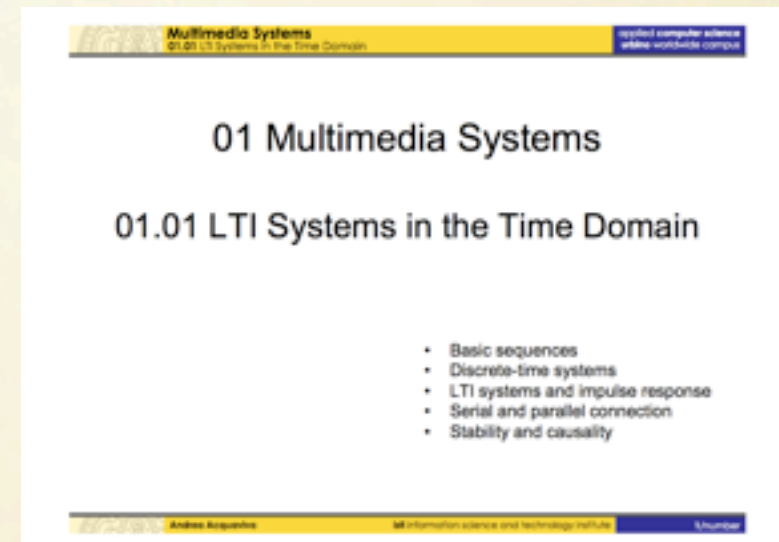
THE WORKFLOW

- At the end of a trial and error process, I elaborated an efficient workflow (as far as I am concerned)



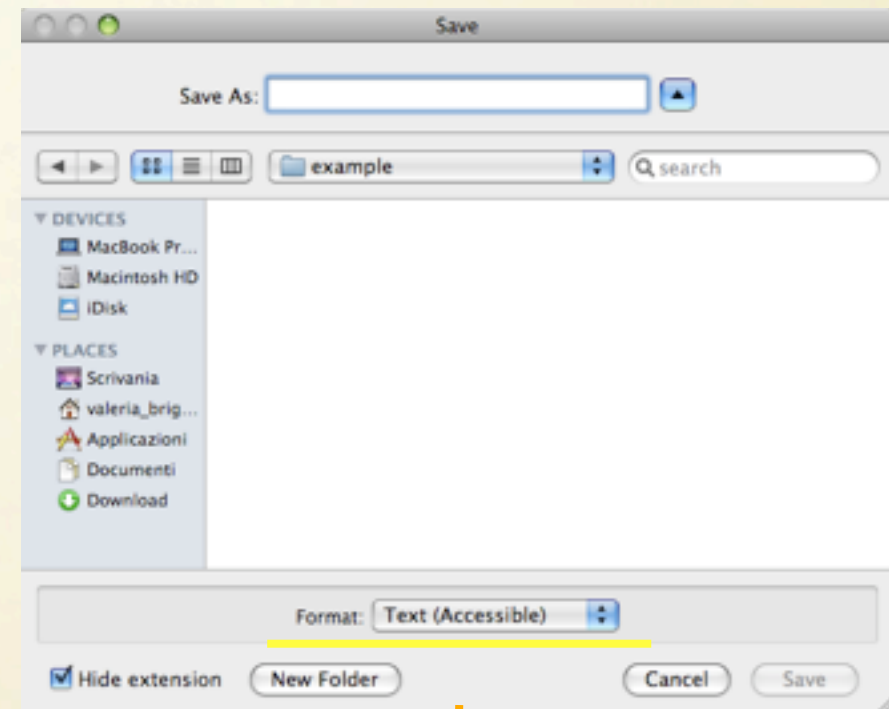
THE WORKFLOW (STEP 1)

- Open the original PDF document using Adobe Acrobat Reader



THE WORKFLOW (STEP 2)

- In Adobe Acrobat Reader. choose "Save as text (accessible)".
- This outputs a TXT file

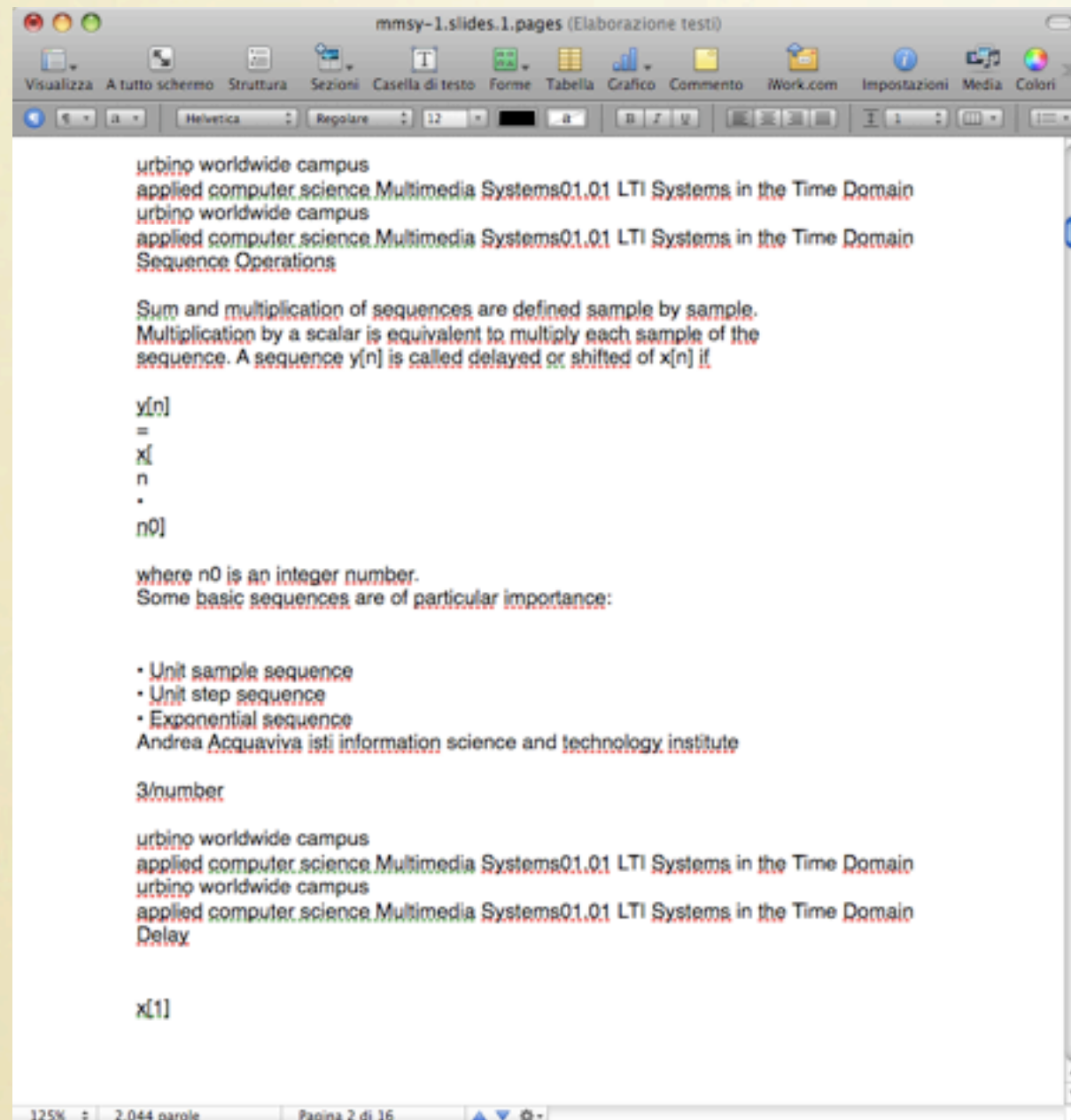


Unit sample sequence

$$\begin{aligned} &\bullet 0, \\ &n \\ &\neq \\ &0 \\ &\bullet[n] = \\ &\bullet \\ &\bullet 1, \\ &n \\ &= \\ &0 \end{aligned}$$

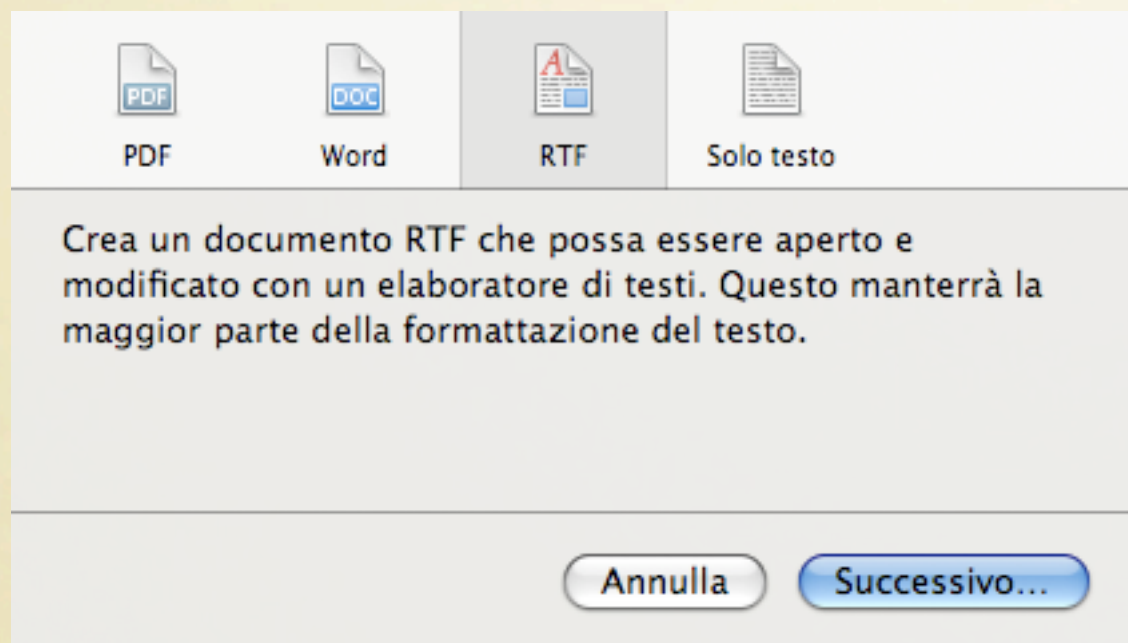
An arbitrary sequence can be represented as sum of impulses shifted and scaled. In general, each sequence can be expressed as:

THE WORKFLOW (STEP 3)



- Open the TXT file in iWork Pages '09

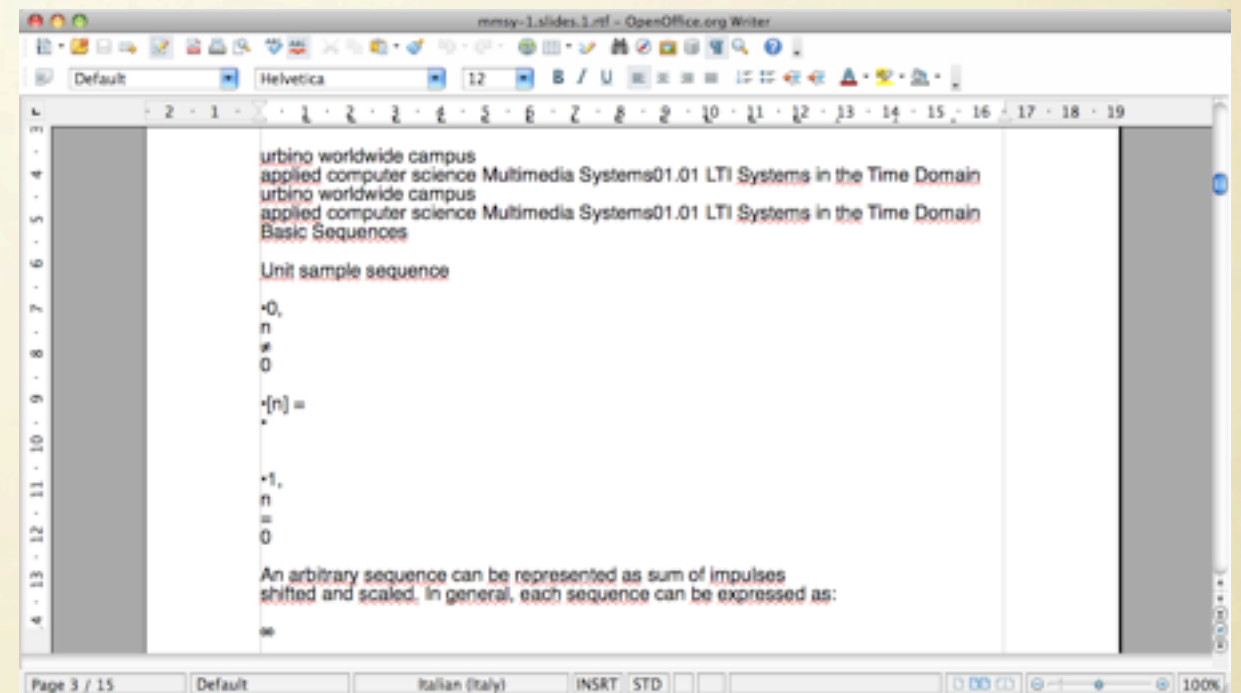
THE WORKFLOW (STEP 4)



- In iWork Pages, select the "Export" option, and choose the RTF format.

THE WORKFLOW (STEP 5)

- Open the RTF file and edit it with OpenOffice.org Writer.
- This resulting RTF file will contain all the text that was present in the original PDF slides, except for the formulae, which are imported as a meaningless set of characters.



THE WORKFLOW (STEP 6)

- Now we need to manually type all the formulae in the original PDF into MathType
- LaTeX is the chosen translator in MathType
- Copy the expression in MathType and paste it into the RTF file in OpenOffice.org Writer.

PRODUCTION TIMES

NUMBER OF SLIDES	TOTAL NUMBER OF FORMULAE	PRODUCTION TIME
17	72	1h36'
15	79	1h52'
19	115	2h34'
19	102	2h24'

CONCLUSIONS

- We depicted a possible workflow to convert non-accessible slide presentations with math contents into an accessible RTF file with LaTeX formulae.
- The student subject of this study case was satisfied and has been able to take the Multimedia System exam.

FUTURE DEVELOPMENTS

- Explore Office Open XML (OOXML): it offers a collection of markups for the description of all components of a PPT document (charts, doc structure). Math formulae are encoded in OOXML using MathML. Since MathType is capable of handling MathML content, we can envision the possibility of automatically extracting MathML formulae from OOXML documents, and generate LaTeX via MathType conversions, further enhancing the production times.

QUESTIONS?

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