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## On the difficulty to design Arabic e-learning system in statistics

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# On the Difficulty to Design Arabic E-learning System in Statistics

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Wolfgang Härdle\*  
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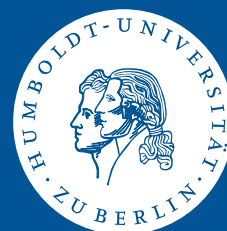


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# On the Difficulty to Design Arabic E-learning System in Statistics \*

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## Abstract

In this paper, we present a case study, which describe the development of the Statistic e-learning-course in Arabic language –”Arabic MM\*STAT”. The basic frame for this E-book, the system MM\*STAT was developed at the School for Business and Economics of Humboldt-Universität zu Berlin. Arabic MM\*STAT uses a HTML - based filing card structure. We discuss the difficulties of the implementation of such a system in to the standard WWW formats and present the solutions needed for Arab educational institutions and the Arabic user. Those solutions are consistent with the Arabic language, and include the modern trend in the e-learning environment.

*Keywords:* electronic books, Arabtex, MM\*STAT, Statistical software.

*JEL Classification* I21, C19

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# 1 Introduction

E-Learning is the modern model of education, transferring the classical text books to an electronic medium. It has become an important stream of education in present and has a promising future. E-Learning uses net work technology to manage, design, deliver, select, and extend classical learning. Our approach, based on the MM\*STAT, provides a flexible e-learning Statistic environment, created at the institute of Statistics and Economics of the Humboldt Universität zu Berlin. It provides e-learning of Statistics in many languages that include English, German, French, Polish, Czech, Spanish, Italian ; see <http://www.md-stat.com>. Our main aim in this project is to extend e-learning concept to include the Arabic language. Originally the MD\*Book is a flexible user interface tool for generating user interactive e-learning documents such as MM\*STAT. This tool uses the LaTeX format file to enable compilation into PDF, Java, HTML. We aim to use the LaTeX file format for creating an Arabic text. As we will show this remains a problem, basically caused by the incompatibility of the standard Latex2html with the phenomenons of the Arabic typography. The learning system (Arabic MM\*STAT) has been implemented in the website: <http://www.md-stat.com>. In what follows, we present in section 2 an Arabic MM\*STAT description. And discuss in section 3 the difficulties to design the Arabic MM\*STAT which involves the Arabic style and the technical problems. In section 4 we summarize our work, given a direction for the future on Arabic LaTeX.

## 2 Arabic MM\*STAT

Arabic MM\*STAT is a Web-based learning platform that provides a fully integrated student environment to learn statistics. MM\*STAT allows an interactive introduction into the world of statistics. The goal of Arabic MM\*STAT designer is :

1. To contribute to the evolution of Statistics e-learning by the development of an efficient system.
2. To create an Arabic MM\*STAT, because there were not enough Arabic statistic e-learning platforms. The purpose of this study is to develop a platform that will be used completely in Arabic, together with other languages such as English and German.

We know that the Arabic language is different from English and other languages in a number of respects:

1. Arabic language is written from right to left.
2. It is possible to form hundreds of words from one root word (al- Fedaghi and al-Sadoun, 1990).
3. In Arabic the definite article and prepositions, are not separated from their following word by a space, on another hand some words have different meanings but have the same written form.
4. The peculiar morphology of Arabic might render methods used for English text retrieval inappropriate. For example, the English phrase "and she wrote it" comprising of four words would be written in Arabic as one word "wakatabathu" (wa=and, kataba=wrote, t=she, hu=it). Moukdad, H., Andrew, L., (2001). Generally, the difficulty with someone who has translated a software product into another language to get a realistic picture of the challenges. Not only are there vocabularies the translator might not know, but they also must adapt sentence structure, significance, and colloquialisms to convey equivalent meaning.

### 3 Difficulties to design, an Arabic MM\*STAT

We now discuss some practical and technical problems. The development of MM\*Stat by (Müller, M., Rönz, B., Ziegenhagen, U., 2000) has been the first step in the transition from traditional textbooks to integrated learning environments. This project is with multiple languages and our goal is to apply this project in Arabic language. To do this, one needs Arabic Windows XP version, as a tool to write the Arabic code. We then have to translate our articles in Arabic Microsoft Word, and save the files with unicode (file.unicode). Another problem is the direction. Writing in Arabic is from right to left but the direction in HTML appears from left to right, which technical problem for working in Arabic. What is the solution for this problem? To solve this problem we use the code *dir = "rtl"* in HTML file at every paragraph and link - Figure - Table and the statistics forms, then the direction of the writing changes from right to left.

MD\*Book Software environment requires LaTeX. Another problem is the LaTeX Format. Arab text does not work with LaTeX . We aim to finding a solution to this problem in our project. There was a project for Arabtex in LaTeX presented by Prof. Klaus Lagally - Universitt Stuttgart. This project was a good step but it is not enough, because the letter in Arab text in this project was written with English, not with Arabic and this project did not have the ability to reduce Statistics on an Arabic Website. This project uses only PDF, not HTML. To summarize, the goal of my work is to create an electronic book in Arabic using LaTeX source code and the MD\*Book tool.

## Arabic MM\*STAT Realisation

Figure 1 presents Arabic MM\*STAT - Cover Page. Figure 2 presents Arabic MM\*STAT - Content Page. The user can enter the courses topics via a list of contents and can go to any desired topic or course chapter. By hovering the mouse pointer over a selected course file for a few seconds will appear to identify the course topic.



Figure 1: Arabic MM\*STAT - Cover Page



Figure 2: Arabic MM\*STAT - Content Page

Figure 3 shows a graphical user interface (GUI) of a statistic topic in Arabic MM\*STAT

and Figure 4 shows the corresponding English version.

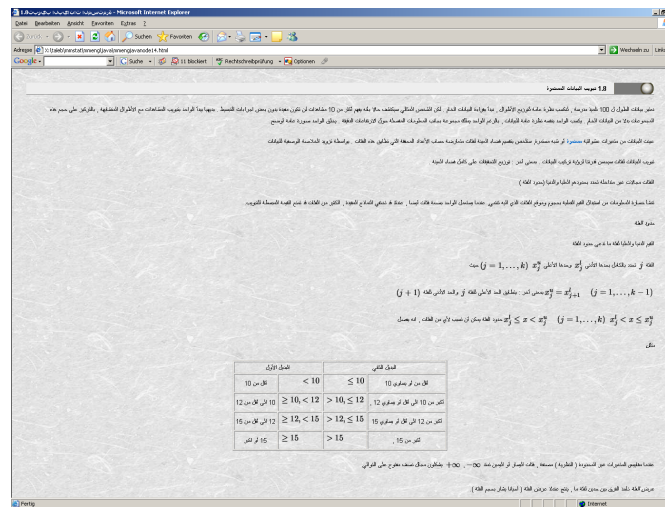


Figure 3: Arabic MM\*Stat: Layer Architecture and Screenshot

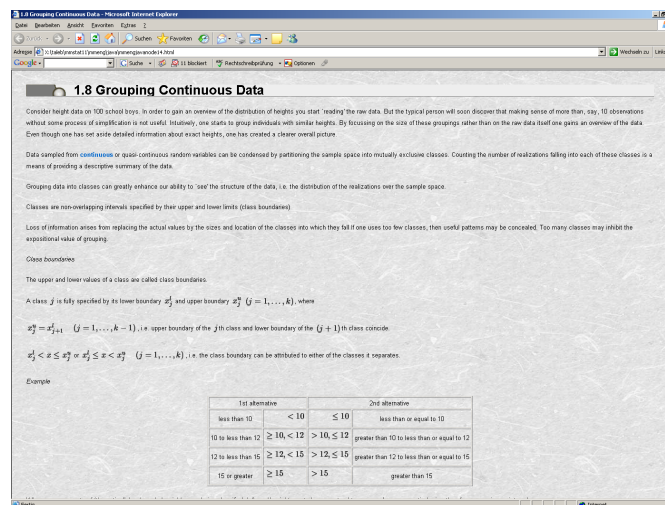


Figure 4: English MM\*Stat: Layer Architecture and Screenshot

The Arabic MM\*STAT Course has five components structures; the lecture, information, explained, enhanced and interactive. Each lecture gives the basic concepts of the general statistical theory, definitions, formulae, mathematical proofs. Arabic MM\*Stat provides the students to compute distribution functions, graphics and derive results for statistical tests. The students or anyone interested in statistics can interactively learn about basic concepts of statistics at any time and anywhere.



## 4 Conclusion

This is the possibility of creating an e-learning system with Arabic MM\*STAT. And discussed the problems encountered, both in the context of the Arabic language itself and the technical problems, which is the nonexistence of a possibility to use LaTeX code in Arabic. Our next goal is to explore possible solutions to the problem of Arabic LaTeX. Actually the goal has to do with XML.

### References

- AbdulJaleel, N., Larkey, L., *English to Arabic Transliteration for Information Retrieval: A Statistical Approach*, Center for Intelligent Information Retrieval Computer Science, University of Massachusetts.
- Al-Fedaghi, S and H. Al-Sadoun. Morphological compression of Arabic text. *Information Processing Management* 26(2): 30316., 1990.
- Bates, T., *Forum on National strategies for E-learning*, IIEP Virtual Institute, 21 October to 15 November 2002.
- Jemni, M., Bahattab, A., *A collaborative approach for development of arabic courses for E-learning, a case study of Tunisian-Saudi Arabian experience.*
- Hammad, S., AL-ayyoub,A.,Sarie,T., *combining existing E-learning components towards an ivle*, Arab Open University, Amman.
- Härdle,W., Klinke,S., Ziegenhagen,U., *eLearning - A Critical Review*, Humboldt-Universität zu Berlin, January 5, 2006.

Lagally, K., *ArabTeX : a System for Typesetting Arabic : User Manual Version 3.00*, Universitt Stuttgart, 1993.

Mungo, J., *e-learning/e-teaching An Implementation and Evaluation of a Finance Introductory Course*, Humboldt-Universität zu Berlin, 2004.

Moukdad, H., Andrew, L., Information Retrieval from Full-Text Arabic Databases, Can Search Engines Designed for English Do the Job?, Canada, 2001.

Müller, M., Rönz, B., Ziegenhagen, U., *The Multimedia Project MM\*Stat for Teaching Statistics, In COMPSTAT. Proceedings in Computational Statistics*, Physica Verlag, (2000).

Maegaard, B., Choukri, K., Mokbel, C., Yaseen, M., *Language Technology for Arabic*, NEM-LAR, Center for Sprogteknologi. University of Copenhagen, July 2005.

Zahran, S., *Promotion of Development-Oriented ICT Applications for E-Learning*, Western Asia Preparatory Conference for the World Summit on the Information Society (WSIS), Beirut, 4-6 February 2003.

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