Medexter Healthcare

ZK is used in Medexter's software MOMO (Monitoring of Microorganisms), a microbiology analytics and clinical tool for hospitals and in order to monitor pathogens and antimicrobial resistances. The software can play an important role in avoiding the occurrence of epidemics inside a medical institution and helps medical personnel with prescribing adequate antibiotics while battling multi-drug resistant bacteria. As a new ZK component, we recently started using ZK Charts for the graphical display of our query results.

About Medexter

Located in Vienna, Austria, Medexter Healthcare develops and markets knowledge-based systems for clinical decision support. The aim of these high-tech software solutions is to promote quality assurance and patient safety in diagnosis, therapy, prognosis, and patient management.

ZK x Clinical Decision Support

We currently use ZK in 3 of our software projects:

ArdenSuite Server – The ArdenSuite clinical decision support (CDS) technology platform aims at providing clinicians and other medical personnel in a hospital with highly efficient medical-knowledge-based support in their daily decision-making processes. Its CDS is patient-specific, as it is based on a person's latest data. The software based on this standardized syntax is applicable in every medical discipline. Initially without specific clinical content, it represents a highly flexible and versatile platform, waiting to be applied to medical tasks or to solve specific clinical problems, when endowed with proper clinical knowledge. The ArdenSuite's components comprise the ArdenSuite IDE for content development and testing, the ArdenSuite Server for content management and processing, and our ArdenSuite Connectors and Extensions for interfacing.

MONI (Monitoring of nosocomial infections) is an intelligent tool for detection and surveillance of healthcare-associated infections (HAIs) in intensive care medicine. It is linked with the medical documentation systems of a healthcare institution and automatically imports electronic clinical and laboratory raw data to process it into surveillance information. MONI thereby allows to identify and monitor healthcare-associated infections without the need for extra data entry by medical or surveillance staff. Due to the integration of fuzzy concepts, MONI also captures those incipient or borderline cases that are normally at a risk of not being recognized.

We are currently developing a new MOMO release and have been adding features and components for the last few months.

The Project

MOMO (Monitoring of microorganisms) is a microbiology analytics tool with a strong clinical feature. MOMO's QuickScan functionality gives immediate single patient overviews with all or all positive, approved results for one patient. It serves as a fast clinical tool for the attending physician and is always up-to-date. As microbiology analytics software, MOMO provides all the information on pathogen occurrence, frequency distribution, and resistance situation in one place. 58 different parameters allow maximum flexibility for clinical, QM, and administrative queries. User-defined templates facilitate reporting and benchmarking.

The Challenge

MOMO is a software that is intended to be used in clinical practice by physicians. It comprises a combination of features used individually or combined by physicians and medical personnel of different disciplines and with different purposes or problems in mind.

We rely heavily on our users' feedback and requests for needed features and extensions. As these users are mostly doctors and other medical personnel, issues are often complex and connected to the well-beeing of actual patients.

This implies that we must be able to implement new features exactly as needed and also customize the user interface to our users' liking. Our GUI components have to be clean and easy to grasp, and the system's performance has to be satisfying for use in clinical routine. Also, it has to be possible for us to make quick and effective adjustments.
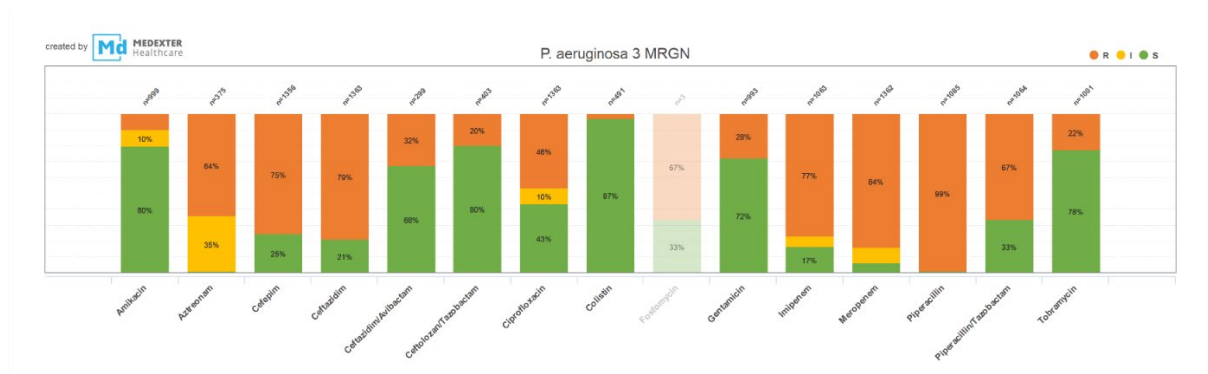
Why ZK Charts

We recently purchased a license for ZK Charts in addition to our ZK license, as this new component enables our frontend developers to quickly generate expressive charts within Java. The strength of ZK Charts lies in its great customizability. Offering countless design commands in Java and enabling the implementation of JavaScript Code to directly modify the underlying Highcharts settings, ZK Charts allows our developers to handle complex design requirements.

Embedded into a ZK-based application, the graphical components created by ZK Charts became an essential feature in MOMO as they do not only facilitate clear presentation of medical data, but also provide an interactive experience for the user. For instance, the connection of a chart and a table can be achieved to enable the user to actively select the data plotted in the graph from a table.

Moreover, ZK's support team responds very quickly, always provides helpful advice, and informs about the resolution of bugs within ZK.

The Result

An important feature of MOMO is the AMR query. Clinicians select a pathogen based on a FlexScan or QuickScan query and MOMO graphically displays the relevant antimicrobial resistance (AMR) situation for this pathogen. Previous versions of this AMR chart had a poor resolution and very few customization possibilities. We re-implemented it with ZK Charts. Now, the AMR chart has unprecedented resolution and design. Moreover, results of insignificant sample size are depicted with a lower opacity to emphasize relevant information. Also, for the first time, export to PNG is supported.

P. aeruginosa 3 MRGN

Future

We are planning on using ZK Charts for additonal graphical components in MOMO. One feature would be a comparison of two or more AMR charts. Another planned feature is to implement a variety of trend charts using line charts this time, instead of bar/column charts.