



Serbian Tribology Society



University of Kragujevac,
Faculty of Engineering

SERBIATRIB '13

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PROCEEDINGS

EDITORS: Miroslav Babić, Slobodan Mitrović



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Preface

The International Conference on Tribology – SERBIATRIB, is traditionally organized by the Serbian Tribology Society every two years, since 1989. The previous conferences were held in Kragujevac (1989, 1991, 1993, 1999, 2005, 2007 and 2011), Herceg Novi (1995), Kopaonik (1997), Belgrade (2001, 2003 and 2009). This year the 13th International Conference on Tribology – SERBIATRIB '13 also takes place on May 15-17, 2013 in Kragujevac.

This Conference is organized by the Serbian Tribology Society (STS) and the University of Kragujevac, Faculty of Engineering. Organizing Scientific Conferences, STS plays a significant role in helping engineers and researchers to introduce in the fundamentals of tribology and to present their experience, solutions and research results.

The scope of the 13th International Conference on Tribology – SERBIATRIB '13 embraces the state of art and future trends in tribology research and application. The following two aspects of tribology practice require special attention. Firstly, the requirement for higher productivity of machinery means that machines must operate under higher loads and at higher speeds and temperatures, and that is why finding the right solutions for tribological processes is extremely important. Secondly, the good tribology knowledge can greatly contribute to the saving of material and energy.

The Conference program generally includes the following topics: fundamentals of friction and wear; tribological properties of solid materials; surface engineering and coating tribology; lubricants and lubrication; tribotesting and tribosystem monitoring; tribology in machine elements; tribology in manufacturing processes; tribology in transportation engineering; design and calculation of tribocontacts; sealing tribology; biotribology; nano and microtribology and other topics related to tribology.

All together 76 papers of authors from 18 countries (Taiwan, Russia, Belarus, Ukraine, Germany, Poland, India, Pakistan, Nigeria, Slovenia, Croatia, Bosnia and Herzegovina, Italy, Romania, Bulgaria, Greece, Turkey and Serbia) are published in the Proceedings. Approximately 37 papers were submitted by the foreign authors and app. 39 papers by the Serbian authors. All papers are classified into five chapters:

- Plenary lectures (4)
- Tribological properties of materials and coatings (29)
- Tribology in machine elements (23)
- Tribometry (13)
- Trenje, habanje i podmazivanje (7) – papers written in Serbian language

It was a great pleasure for us to organize this Conference and we hope that the Conference, bringing together specialists, research scientists and industrial technologists, and Proceedings will stimulate new ideas and concepts, promoting further advances in the field of tribology. The

Editors would like to thank the Scientific and the Organizing Committee and all those who have helped in making the Conference better. We would like to thank especially prof. Miroslav Babić and prof. Branko Ivković for the helpful suggestions and support.

The Conference is financially supported by the Ministry of Education, Science and Technological Development, Republic of Serbia.

We wish to all participants a pleasant stay in Kragujevac and we are looking forward to seeing you all together at the 14th International Conference on Tribology – SERBIATRIB '15.

Kragujevac, May 2013

Editors

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Society

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IMPLEMENTATION SQL REPORTING SERVICE IN THE TRIBOLOGICAL DATA BASES

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Abstract: In the work it will be presented one of the ways how to publish the results of the scientific and research work quickly and efficiently and these results are saved in the data bases, and this is called tribological researches. The developed technology in the Reporting Services enables us to avoid the writing of the application programmes or using the data in the other section of the software, type Statistica or Excel, and it enables us directly to form the presentation part over the bases. Scientists and researchers, as the best way of scientific communication, have both the role of the creators and the users and they have started to be publishers and distributors, and this technology enables them all of this.

Keywords: tribological data bases, SQL Reporting Services, processing of the reports

1. INTRODUCTION

Today, in the world of information technology, reports are the main key so that we can publish the results in the scientific researches. It can be said that the reports are the final and main step of the long and complex process of collecting, keeping, transforming and manipulating of the data. Creating of the reports is presentation of working with the data bases. All reports are not the same. The value of the report is information. Information are not just the data, but they are the data transformed into something useful, something that has value. This transformation is extremely important. People can read and publish the data in many different ways and that is the reason why the data are all around us, but what we need in the 21st century to complete our job is well valued, correct, quick and appropriate information.

There are a lot of software tools for creating the reports that enable everyone to access to an open number of the data which are all around us. However, all these who use these data are not familiar to the work techniques and that can be a huge problem. The data used to be saved and transferred orally, in the written form and today mostly in an electronic form in our computers in the data bases but the data are not usually from the same base and they do not come from the same base. Extremely

small number of reports actually has the data in the base.

Today if you want a report to be valued as good and to be in the terms of standards of using the information technologies, it must be reliable, quick, to have a good presentation, to have flexible form, connectivity and in the end that it can be used by the correct tool. One of the tools or technologies whose development still is in progress is Reporting Service (RS) which is the part of SQL Server.

All tools and applications in RS are made using the API (Application Programming Interface). Reporting Services contains all that is necessary that researchers and well trained business users to publish a report. Completed reports are guided by a server where they are. The final users to whom these reports are made for, have an efficient and full report.

The process of correction and analyses by using the information of Reporting Service leads to generation of knowledge of the data and it is mostly known in the IT world as Distributed intelligence (knowledge technology). In this case, Reporting Services can be seen as server-based platform with the developed tools for generating, manipulation and publishing of the reports.

Reporting Services evolved into a sophisticated reporting platform which gives new abilities of the efficient analyses and an attractive presentation

of information which are saved on the hard discs of the server, opening completely new dimension of working with the the data and reports.

Reporting Services must be understandable, we must be able to read them and they must point to the date that we need for the analyses and verification of the results. To achieve the goal we want,we can design the report that specific data shows like a table/chart or any other form that can be understood, Figure 1.

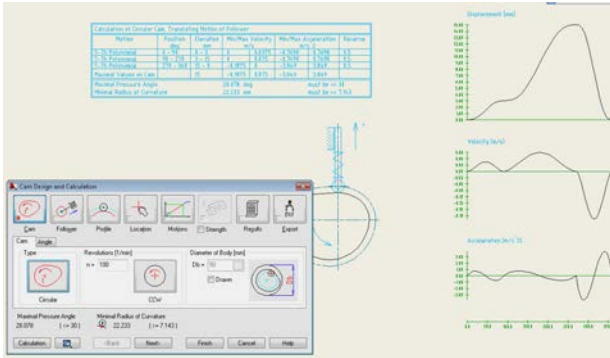


Figure 1. The picture of the standard report.

The reports can be also shown in an ad hoc form.

2. PROCESSING OF THE REPORTS USING THE REPORTING SERVICES

Reporting Services is a part of MS SQL platform which offers opportunities of processing and manipulating the data, Figure 2 [1].

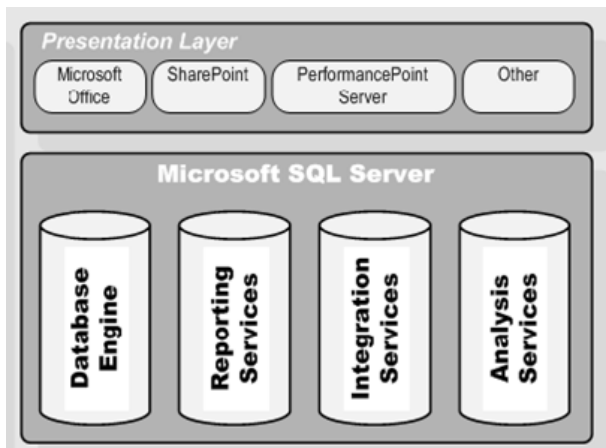


Figure 2. Architecture of the MS SQL Server platform.

Database Engine is for packing, processing and securing of the data. Integration Services supports different typrs of the data, which have the same source of the dataand technologies as well as their integration Integration Services is mainly used for transferring,transformation and reading of the data. Packets of the data of Integration Services are mainly used as sources for the reports. Analysis Services represents multi-dimension base for the quick reporting and generating of the questions and

trends. The data are not for the use unless there is a way that they can be shown in a way that the users can understand them. Presentation Layer platforms enable different ways of presentation like Microsoft Office, Microsoft SharePoint, Microsoft Performance Point Server or some other comparable applications.

Basic components and logic architecture of Reporting Services are shown in the Figure 3 [1].

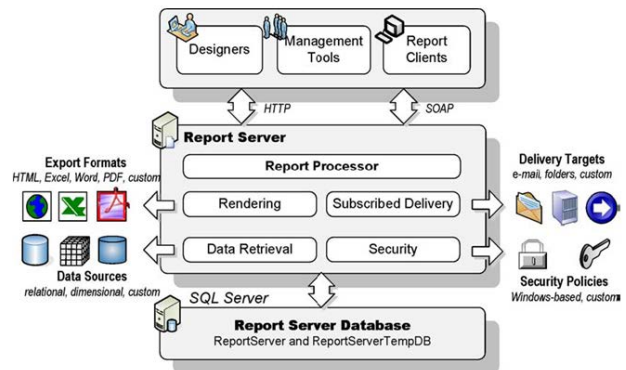


Figure 3. Reporting Services logical architecture

In the centre of Reporting Services architecture is a server , web-oriented middle part which accepts the requests,processes them and on the base of that generates the reports. An illustration shows a simple sheme of Report Server. Repot Server communicate with the the users in two ways: by url or through web service. The component Report processor is responsible for processing of the reports in so called run time. This means that the report sends the data to an user,combining the data from the base with the parametres making the final report sent in the requested form.

An important characteristic of Reporting Services is that the archecture can be enlarged through special modules which are called extensions. When the standard extensions are not enough, programmers can extend the opportunities of RS by puttingin their own extensions. Like the sources of the data,the users can export the report results in a several most popular forms like Microsoft Excel, Microsoft Word, Adobe Acrobat PDF, HTML, SCV, it can be shown in the pictures or the new extensions can be written for the sending of the report or in some other forms.

The definition of the report and its adjustments are saved in the data base of Report Server. Report Server is implemented as two SQL Server bases (Report Server and Report Server DB) which are installed during their configuration. When we upload the report, Reporting Services saves the definition of Report Server in the data base while the other data base – Report Server DB contains and saves temporary information on the report and its truthfulness.

2.1 The life cycle of the report

The life cycle of the report is the events or the activities of the report, start from the moment when we start creating it. In the Figure 4 we can see that the life cycle is made of Authoring, Management and Delivery phases [1].

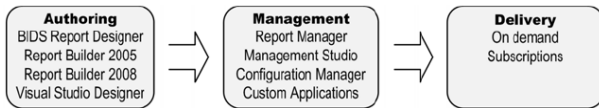


Figure 4. Work with the report

In the Authoring phase, the author of the report uses one of the Microsoft designer reports (Report Builder). When the report is completed, the author can upload it so it can be seen by the final users. In the Management phase, the administrator configures the generated reports and developing surrounding where it is going to be shown. The administrator can use Report Manager to organise the report in the folders as well as to set the security measures so that the access can be authorised to the users. When it is configured, the reports can be seen to only those to whom this right is authorised. The report can be seen by the final users typing URL address in the web searcher or alternatevely using the option schedule -through some channal like an e-mail.

The designers of the report are the tools which the authors use for the definition of the data looks at the moment of creating the reports. Since the technological knowledge and the experiences of the authors can vary, it is not easy to create a designer report that can satisfy the need of the all users. In the Figure 5 allthe designer tools for the creating of the report are shown with their basic characteristics [2].

| Designer | Audience | Capabilities |
|-------------------------------|-------------------------|---|
| BIDS Report Designer | Developers, power users | Full-featured reports |
| Report Builder 1.0 | Business users | Basic ad hoc reports |
| Report Builder 2.0 | Power users | Full-featured reports outside Visual Studio |
| Visual Studio Report Designer | Developers | RDL 2005-compatible local reports |

Figure 5. Tools for creating the reports and their comparison

It is important to say that all mentioned report designers support RDL standard (Report Definition Language).

2.2 Physical architecture of Reporting Service

In the Figure 6 we can see the physical architecture of the Reporting Services, which is made of three Report Server applications: Report Manager, Report Server Web Service and Background Processor. In the physical architecture we can see an implemented network interface which includes Service Network Interfaces (SNI) which checks new requests HTTP.SYS. HTTP.SYS je HTTP driver which accepts the

requests and sends them to an application that should answer to these requests. As a part of the configuration of the Reporting Services, it must be said that URL address report server i Report Manager. Reporting Services Windows service has three server applications: Report Manager, Report Server Web Service and Background Processor. Behind the scene, this service in fact creates three net applications which will host them.

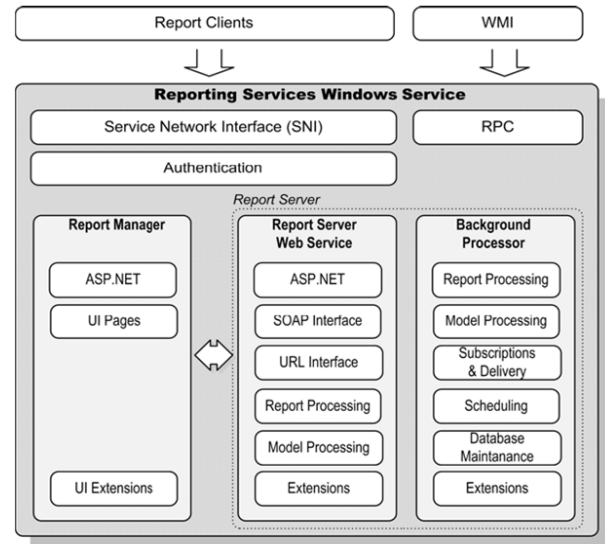


Figure 6. Reporting Services 2008 architecture

Report Manager is an ASP.NET web application which enables management and the look into the abilities of the Reporting Services instance configured in the natural code. We can see Report Manager as a client application configured with the report of the server. Thanks to the same hosting model, configuration adjustments of the Report Manager and Report Server Web service are kept in the same configuration file in rs report server. confingDue to this, Report Manager can add some new extensions. For example, if the user develops new extension, using C# or VB.NET we can configurate in the Report Managers a web control and later use it as we adjust the details of the report.

Report Server Web service processes the reports by using the systems on-demand. When the user clicks on the link pages where the reports are, he/she sends the requests to the Report Web, service accepts this request, processes this request and returns the report to the client. To make it easier integrations with the different types of the reports, Report Server Web service enables the use of URL and SOAP protocol and their integration options.

Background Processor is an application which job is to accept all the tasks which are in an unmarked mode. For example, when the description of the event is accepted, Background Processor interprets the description of the report and sends it to the final destination. Basically, its job is to

process the reports, not to communicate with Report Server Web service. Instead of this, both of the applications communicate with the Report Processor in the same time.

Report Processor does not save the whole report in the memory, but it is processing the report on demand, as it is shown in the Figure 7.

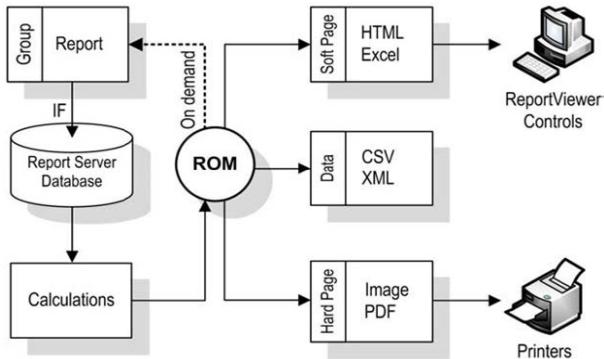


Figure 7. Grafic picture of the processing and the report

At the moment when Report Processor notes the new request, (request), it will take the data and it will match them with the report template making the middle form of the report. That report, processor saves in the Report Server Database. Point is that Report Processor takes and saves only the parts of the report, for example, grouping, sorting and etc. In the phase of the investigating of the report and saving it, Report Processor uses Render Object Model (ROM) an object which is forming the form that we can show. Textbox values and data are processing every time on-demand when we want to see the report.

2.3 The connection of the tribological bases of the data with the reports

Tribological data base, whose logic structure and content are shown in the [2], are connected to already formed template file for the creating of the report. Working surrounding is Visual Studio, where we can connect the data base to the report from the file Report.rdl created in SQL Server Business Intelligence Developer Studio. The starting point of the model form of the connection is shown in the Figure 8 [3,4].

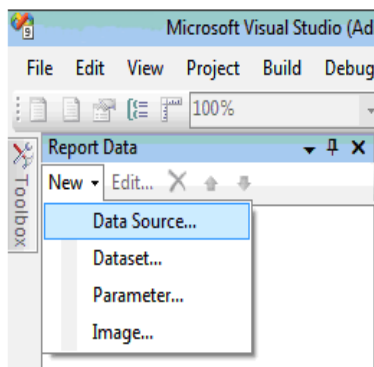


Figure 8. Adding Data Source...

After the connection is finished, it is possible to prepare the data by hand, or write SQL request, which will be use full for the report. Projection will define the columns and selection will define the lines of the data base which will be used in the report, Figure 9 [2].

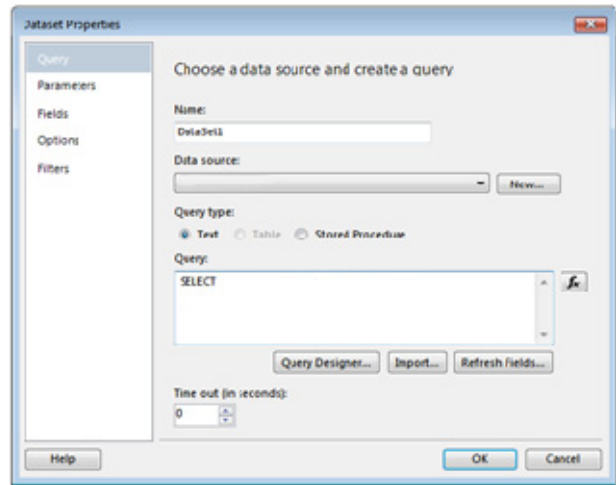


Figure 9. Defining of the requests for the data selection.

In the next step, we will select the way of the showing the data. Presentation of the data by the diagram versus the charts has more visual effects. The diagram can be added in one or two ways, moving control Chart from Toolbox or by pressing a click of the right mouse on the desktop Insert → Chart, Figure 10 [3,4].

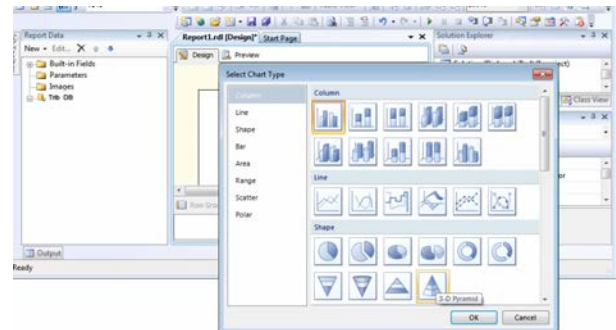


Figure 10. Selection of thr type of the diagram.

After we had selected the diagram, we need to connect the Design Body in the dialogue window with the values which are chosen from the data base with the parametres of the NET control which describe the centres of the diagrams. When it is clicked on the diagram, it will show in the right,down part where we need to put the columns - results of the requestsfrom the data bases (parts in the command SELECT), Figure 11 [3,4].

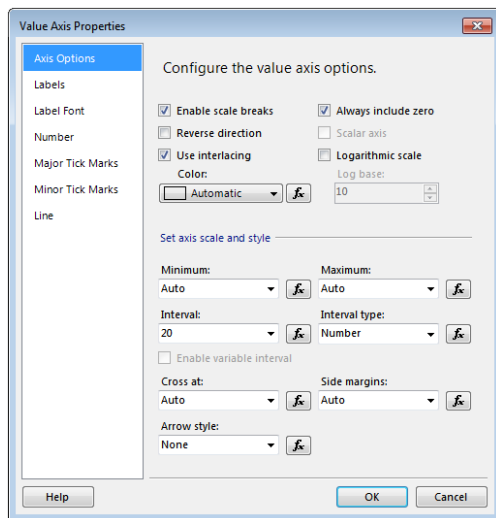


Figure 11. Adjustments of the centers of the parameters of the diagrams

After we turn off View mode, BI platform will give the Render report by processing the request and making the graphic interpretation based parameters and adjustments. In the Figure 12 we can see the final report of the base of the data, TRIBOLOGYCAL_RESULTS.

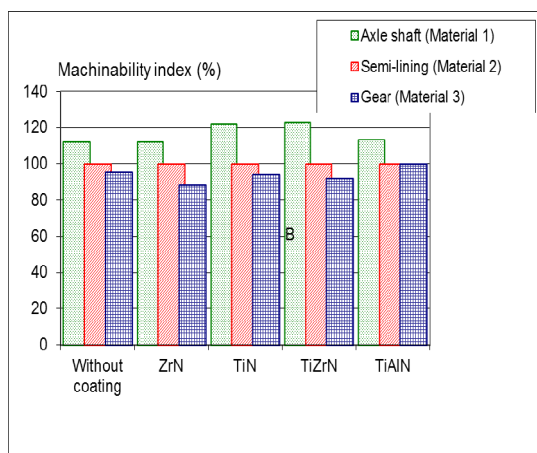


Figure 12. The final report after the adjustment of the parameters

Obviously the report is checked and the values are easily seen, can be seen and are clearly shown.

3.CONCLUSION

Reporting services is a complex and modern technology with the tendency for further adjustments and enlargement. Because of the need and implementation for these kinds of technologies, it grows the need that we must know and use them. Reporting services is a great technology which makes the job easier to the business world, and it can also be of great need to the scientists while they are publishing the results from the data base, and it facilitates the work to the IT technicians.

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