



Statistics and Analyses Tool **SA Tool**

Statistics and Analyses % 

Technical white paper

Consulting Engineering

LAZAROV

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1 Summary

Statistics and analyses tool is used for statistical processing of data from the warehouse simulator. It gives a picture of the total flow of palettes in the warehouse system. Information about every palette that enters and lives the system is stored in database. And according to that data are generated reports for the path of palettes, their distribution in the warehouse, it is given ABC analysis in tabular way and in chart way, it is also given the number of errors that are happening in the warehouse.

2 Introduction

Statistics and analyses tool is windows based application which main purpose is logistics support to the main Unilog¹ product, the warehouse simulator. This application works on database background from where it takes the needed information about palettes and elements in the warehouse. The database is designed to store data about the path, source and destination of every palette that enters or leaves the warehouse. The database is populated with data from real data or from simulator. When that is done then this is starting point of where the SA Tool can begin to operate and make calculations about the statistics in the system.

SA Tool is user interface which presents statistical data in readable form. Every report about the system is written in Crystal Reports 10. This is done with support of .NET.

3 SA Tool Description

3.1 Welcome screen

When user starts the application, the first screen that is shown is like figure 3-1. On this welcome screen the user is informed that he/she can choose one of the categorized reports:

- Reports about palettes and their path;
- Reports about palettes and elements in the warehouse;
- ABC analysis in tabular and graphic way;
- Reports about errors in the system.

¹ Unilog is former name of Lazarov Consulting Engineering which was used before rebranding in 2008

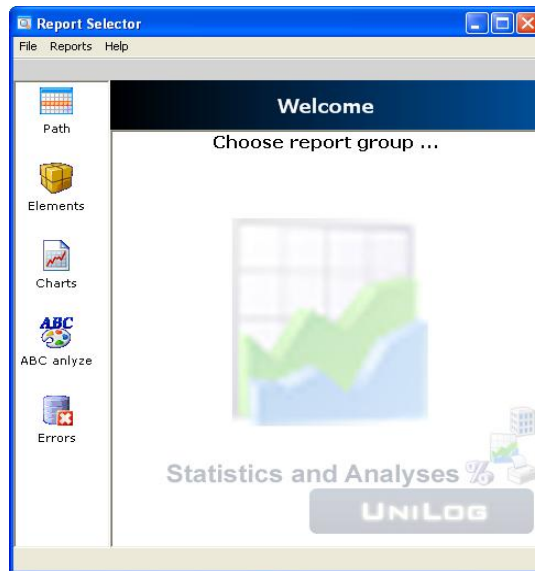


Figure 3-1 Welcome screen

3.2 Palettes per path

The first categorization is made on statistical base of the movement of palettes in the warehouse. The user can see the movement matrix from starting date to ending date. That is one of the benefits of this tool, and that is the ability of easy changing the parameters of every report. Also the user can see the actual moment or the last moment movement matrix and that is according to the moment parameter, which can be second, minute, month or year. User can also see and analyze the whole flow of palettes, palettes per path, palettes per destination, and palettes per source and time distribution which gives very good graphical presentation of how many palettes stay on some time interval. All these reports can be selected from the panel that looks like figure 3-2.

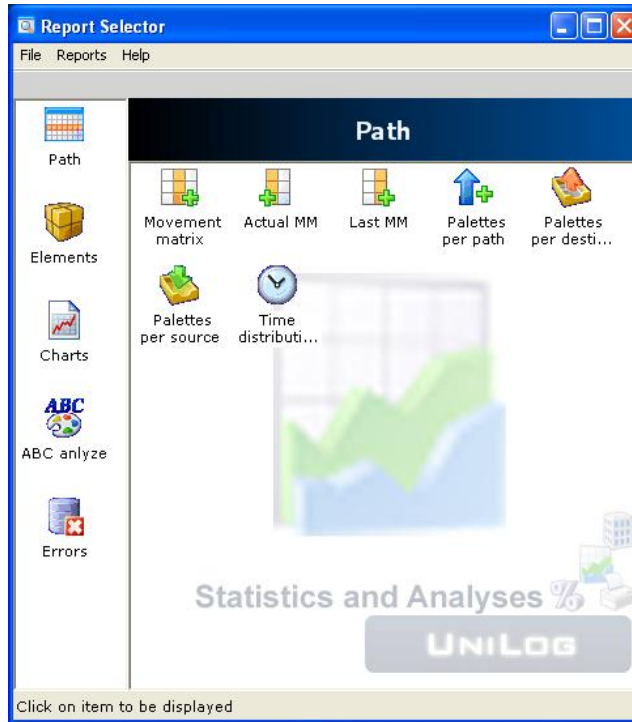


Figure 3-2 Path analyses

When some report is selected the parameter window is shown (figure 3-3). The user can easily change parameters and get the required data.

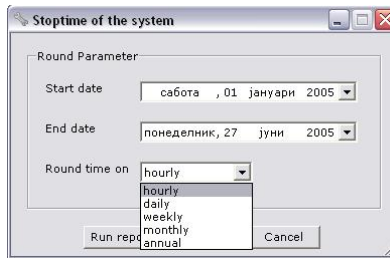


Figure 3-3 Parameter window

3.3 Palettes per element

The warehouse has its own structure. It consists of modules, levels and sections. Every section has elements of any kind such as conveyers, cranes, shelves etc. This part is responsible for giving statistics and analysis of the distribution of palettes in the warehouse. SA Tool offers five different reports for:

- Palettes per shelves;
- Palettes per element;
- Palettes per section;
- Palettes per module and

- Palettes per level.
- The user interface looks like figure 3-3 and the report looks like figure 3-4;

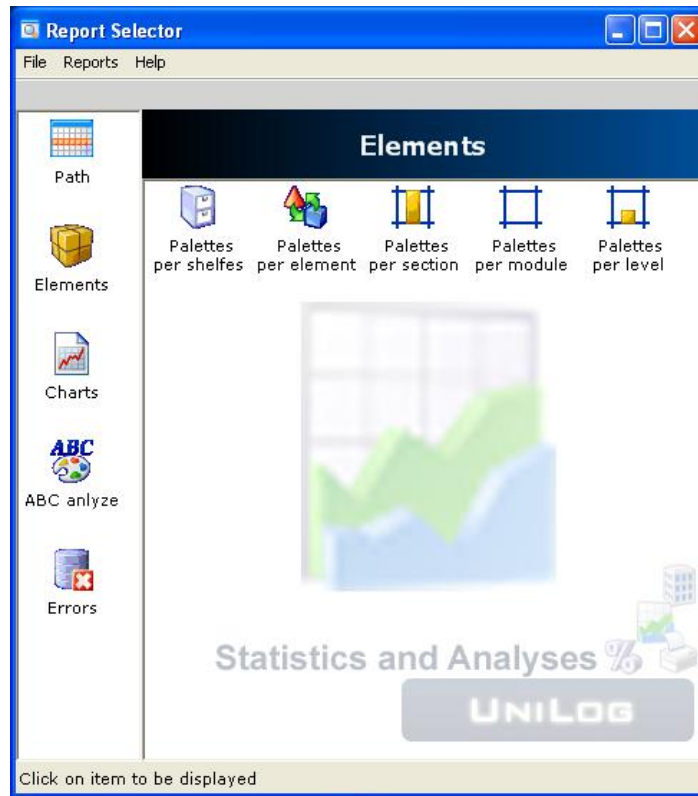


Figure 3-4 Palettes per elements

Element	Palettes	AnalyzeTime
1	224	11:18:21.4E
2	6	0:00:00.14
3	40	0:00:00.14
4	40	0:00:00.14
100	152	11:17:52.4E
103	115	40:23:26.0E
104	102	50:16:11.0E
105	82	29:37:36.1E
107	83	0:00:07.32
108	79	0:00:12.02
109	74	0:00:07.36
110	76	0:00:07.03
111	74	0:00:02.35
112	78	11:16:57.26
113	78	0:00:01.44
117	78	23:59:42.3E
119	71	0:00:01.41
120	69	11:26:21.13
121	66	0:00:04.42
122	62	0:00:06.37
124	65	2:04:22.0E
126	81	2:14:23.39
127	53	0:04:43.03
130	298	0:00:06.96
132	77	0:00:04.04
143	3	2:14:18.2E
145	3	0:00:00.02
166	1	0:00:00.02
167	1	0:00:00.02
171	1	0:00:00.02
171.2	3	0:00:00.02
180	1	0:00:00.02
181	2	0:00:00.02
184	2	0:00:00.02
186	6	0:00:00.21
219	1	0:00:00.01
220	1	0:00:00.02
221	1	0:00:00.02
222	1	0:00:00.02
223	2	0:00:00.02
224	3	0:00:00.12
240	1	0:00:00.01
245	11	0:00:00.21
246	10	0:00:00.16
347	11	0:00:00.21
348	11	0:00:00.21
349	1	0:00:00.02
350	2	0:00:00.02

Figure 3-5 Number of palettes per elements report

3.4 ABC analysis – graphical and tabular mode

Activity Based Costing (ABC) is an accounting technique that allows an organization to determine the actual cost associated with each product and service produced by the organization without regard to the organizational structure. The SA Tool gives ABC analysis in graphical and tabular mode. This can be selected from different panels from the user interface, see figure 3-5 and figure 3-6.

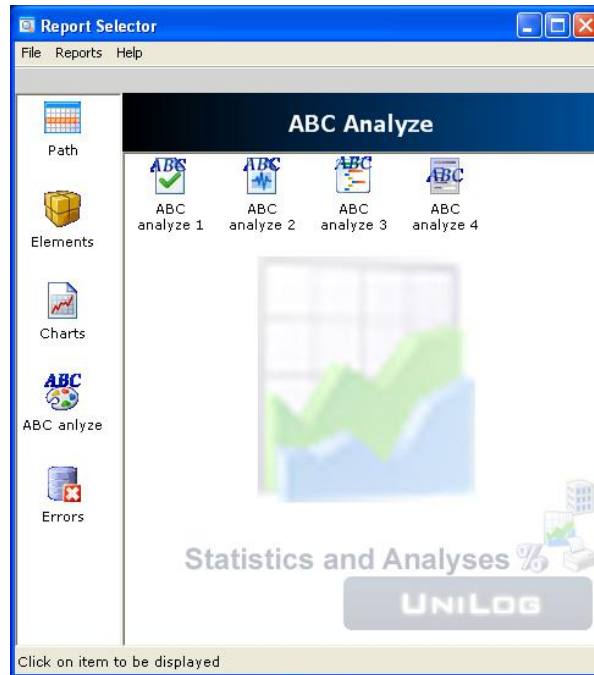


Figure 3-6 ABC analyze – tabular

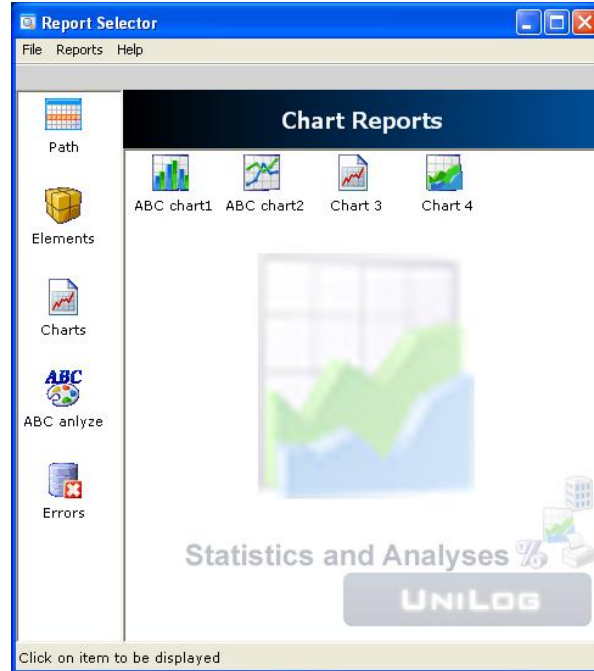


Figure 3-7 ABC analyze - graphical

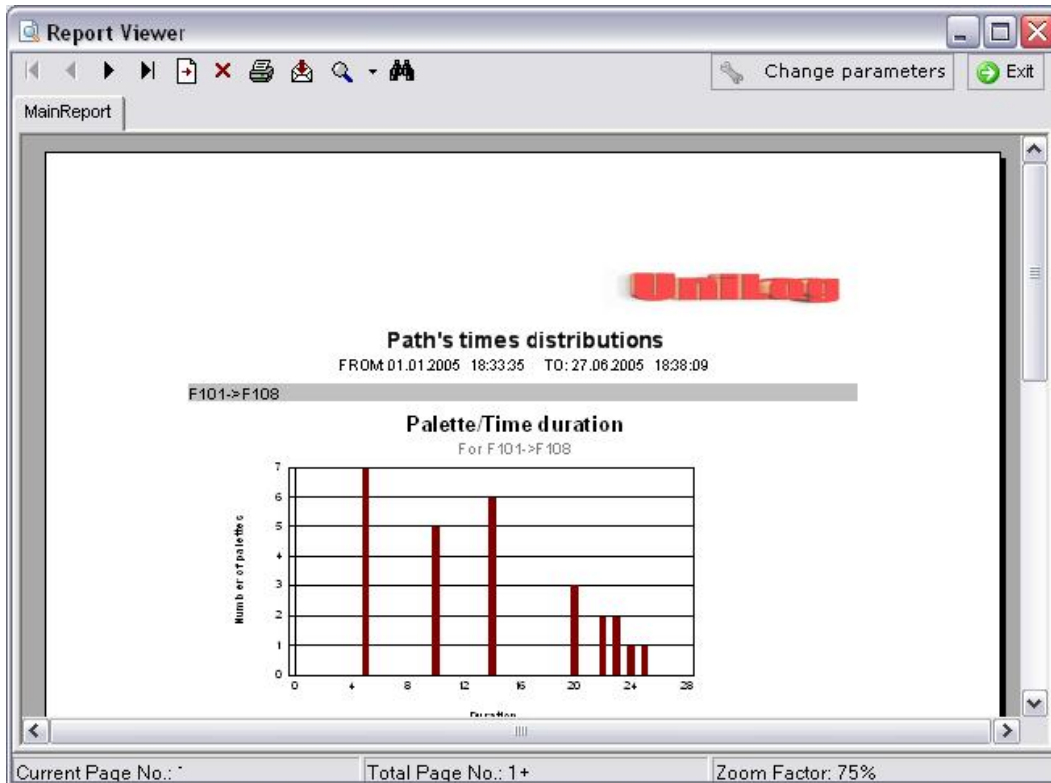


Figure 3-7 palette/time distributions

3.5 Error reports

The warehouse system has real chances to have errors on its elements such as something is broken and the whole system doesn't work or some part of the warehouse is in failure. Thus the system is stopped and needs some time to be repaired. The manager of the warehouse has opportunity to see all kinds of errors that has appeared and what are the reasons for stopping the system. He can also choose list of all errors, grouping of errors per elements or grouping error type per element. See figure 3-8.

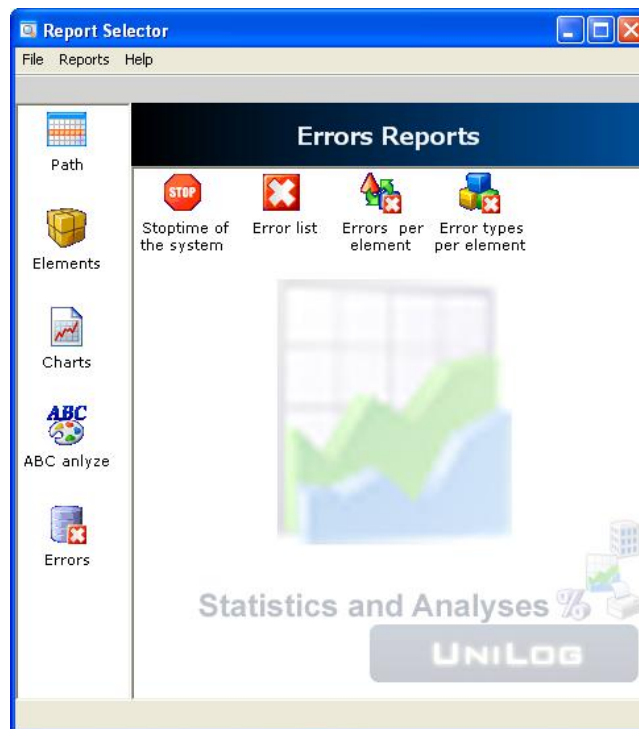


Figure 3-8 error reports

4 Benefits of SA Tools

The main benefit of this application tool is the opportunity for the user to choose appropriate parameters that are relevant to every report. In this way the report is not static, it is live, it is dynamic. Every report that is written can operate on the data from the database and can give a complete picture and good representation of that data. The reports are dependent on the time when data are loaded in the database, so there can be as many simulations as user wants or the database can be filled with real data and statistical

analyses on every new inserted data can be produced. The graphical representation like e.g. charts enables easy and quick understanding of the simulation or real data.