

GENERATION OF REPORTS USING CRYSTAL REPORTS IN MS VISUAL STUDIO ¹

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Abstract:

Crystal Reports allows users to design highly formatted reports from multiple data sources like databases, XML files, Excel sheets etc. with less written code. It provides wide range of charting and visualization to make a report more appealing and easy to consume. Crystal Reports gives a clear idea of business interpretation thereby enhancing efficiency and productivity. Crystal Reports is compatible with standard development environments like VB.NET, C# etc. The objective of this research paper is to visualize, design and compose reports using Microsoft Visual Studio 2017 and SAP Crystal Reports 2016.

Keywords: SAP Crystal Reports 2016, Microsoft Visual Studio 2017

Introduction :

Reports allows gliding through data rapidly and efficiently, saving time and determining the direction one should take along with proper decisions. Reports make it clear for decision makers to understand the enterprise for a better vision of the business. Different companies deliver critical information to their business users through reports.

Crystal report is a business intelligence application, which provides robust, user-friendly and effectual reporting functionality. Since 1993, Crystal reports have been part of Microsoft Visual Studio. Crystal reports were fully integrated in Visual Studio before 2010. In the later versions of Visual Studio, a compatible version of crystal reports should be installed to generate a crystal report project or website. Crystal Reports can link with different databases as per the user's choice which can be fascinating for presentation purpose or for delivering reports. It favors us different outlines and data presentation format with an easy GUI. GUI provides point and click methodology that can accomplish "what you see is what you get" (WYSIWYG) by simply dragging and dropping object into the report canvas.

Different consumers prefer distinct languages and formats making Crystal Reports fulfill their needs accordingly. It delivers personalized and reliable information therefore it is helpful in building strong relationships with business partners, users and consumers. Crystal Reports is feasible and great reporting solution that provides an intuitive working interface and organized workflows.

Application:

Crystal Reports features an extensive SDK for creating and manipulating reports. Through SDK we can programmatically interact with the reports at runtime. Crystal reports provide different functionality object models that can be utilized in a worthy manner. The functional object models can be stated as

- Crystal Report Viewer
- Report Document
- Report Client Document
- Info Object

Crystal Report Viewer:

It is a basic object model of Crystal Reports. This class provides methods, events and properties that can remold and grab information regarding appearance and functions of Crystal Report Viewer. Window namespace and Web namespace both contains this class. Many elements are replicated in both namespaces with a little variation which helps to support the dissimilarity in the windows

and web platforms. Windows version of CrystalReportViewer contains all major classes and events shared by the web and windows version. Web version too contains same classes as the windows version but in addition it contains different events related to how ASPX pages loaded. One can assign a path string to the CrystalReportViewer controller directly.

Crystal Report Document:

This class delivers an additional extensive object model for the SDK rather than CrystalReportViewer object model. This class pictures a report and involves properties and methods to format export load and print reports. In this object model we can use the ReportDocument object model to confine the report through a sample object of ReportDocument.

Report Client Document:

This class represents the most robust and solid object model for handling reports. This model organizes the complete report in the SDK. This helps to create, redesign and store changes to every detail of the report programmatically. This SDK contains a series of libraries data definition models.

- ReportDefinition- the style of the report.
- DataDefinition- the field explorer.
- RowsetController- the values of each row that is processed at runtime for viewing.

In later versions i.e., SAP Crystal Reports 10 and up, the partition between object models were eliminated. To achieve this, the ReportDocument model was utilized as a proxy service to ReportClientDocument model.

Methodology:

Problem Statement:

Crystal Reports comes into picture when we need to design and create reports for a specific purpose using any database connectivity. This can be used where we have to create reports for a large amount of database for every individual.

Working:

Crystal Reports contains 5 sections which help to design reports. They can be defined as:

- Report Header
- Page Header
- Details
- Report Footer
- Page Footer

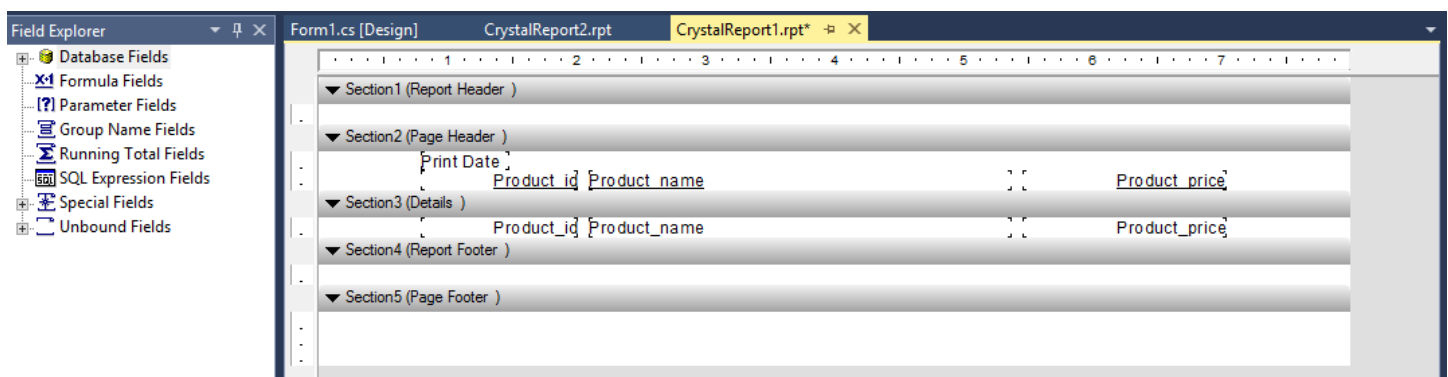


Fig: Sections of Crystal Reports

The Report Header section is generally used to title information that one wishes to make appear at the beginning of the report. Different cross tabs and charts that contain information of the report can also be used. The report header appears by default in every report that is created. One can suppress this portion of the report if they do not wish to print this portion. Report header can be divided into subsections to increase the presentation quality.

Page Header

The page header section is basically used to represent information that needs to appear on the upper portion of each page. This includes chapter names, document name and other quality information. This section can also be divided into relevant subsections as per the requirement. One cannot set the page orientation since the section is attached to report header.

Details

The details section is the main body for the report and is printed only once. A mass section of report data is usually surfaced in this section. This section contains same formatting options as the other sections. Most of the information that is linked through the database is displayed in this part of the section. Insertion and manipulation of tables can be easily worked on. Different formulae can be applied on tables and values can be calculated accordingly. The values of rows and columns can be easily calculated for various purposes and can be manipulated accordingly. All sorts of formulae according to the requirement can be used for various purposes. It also supports insertion of summaries, variances and calculations without any programming.

Report Footer

The Report Footer section is generally used to title information that one wishes to make appear at the end of the report. Different cross tabs and charts that contain information of the report can also be used. The report footer appears by default in every report that is created. One can suppress this portion of the report if they do not wish to print this portion. Report footer can be divided into subsections to increase the presentation quality.

Page Footer

The page footer section is basically used to represent information that needs to appear on the lower portion of each page. This includes author names, document name, page numbers and other quality information. This section can also be divided into relevant subsections as per the requirement. One cannot set the page orientation since the section is attached to report footer.

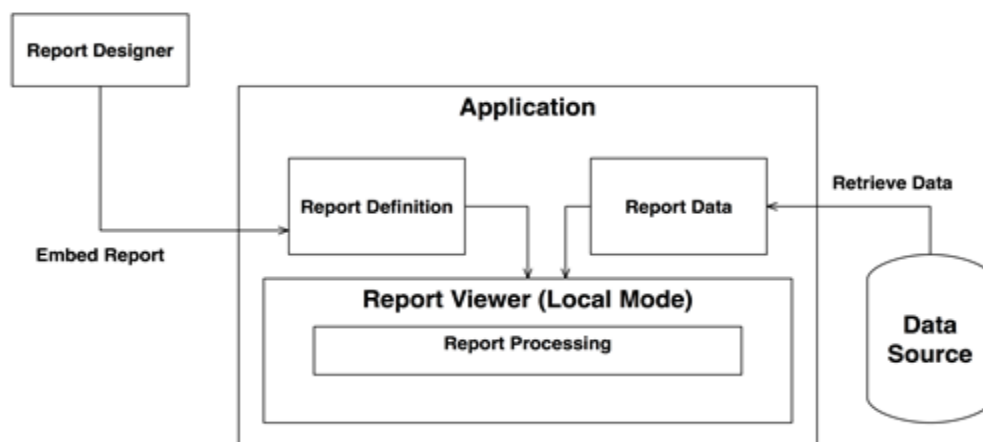


Fig: Workflow of Crystal Reports

Report Viewer sends a query to the database, and retrieves the required information and then formats the data that can be easily understood by decision maker. The query sent is almost similar to any other database query. Once it obtains data at the deepest level it has a three pass system that allows to process data obtained in an efficient manner. Every time data is read and manipulated a pass is used by Crystal Reports. Dependencies are examined inside the report which needs certain calculations that has to be

performed before others. The three pass system manages a hierarchy of calculations very easily, processing raw calculations first and then aggregates them later.

PASS #1

- Retrieval of record from database.
- Applying the selected record to Crystal Reports.
- Applying saved data formulas to Crystal Reports.
- Arranging, summing and grouping the Records and calculating subtotals for individual groups.
- Mapping, creating charts and Cross-Tabs based on database.

PASS #2

- Grouping selection formulas.
- Run all totals.
- Creating Cross-Tabs, maps, charts that needs totaling for different formulas applied.
- Generation of Sub-Reports.

PASS #3

- Page Count is determined using special fields like Page N of M field.

Conclusion:

Reports are always important as they have flexible features like on-report categorizing, refining, and the ability to work out on detailed informative data that allows business users to get a general idea of the situation. With fewer report, dependency on everything else reduces. In this paper, we have demonstrated how we went through Crystal Reports and how effectively and easily it can be used. Crystal Reports helps to achieve scalable and flexible reporting approach. It also provides ready to consume information.

Acknowledgment:

This acknowledgment is to express our deepest gratitude to all the people who have guided us during the period of preparing this paper. This paper will be helpful for those who are interested to seek information on this topic.

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