

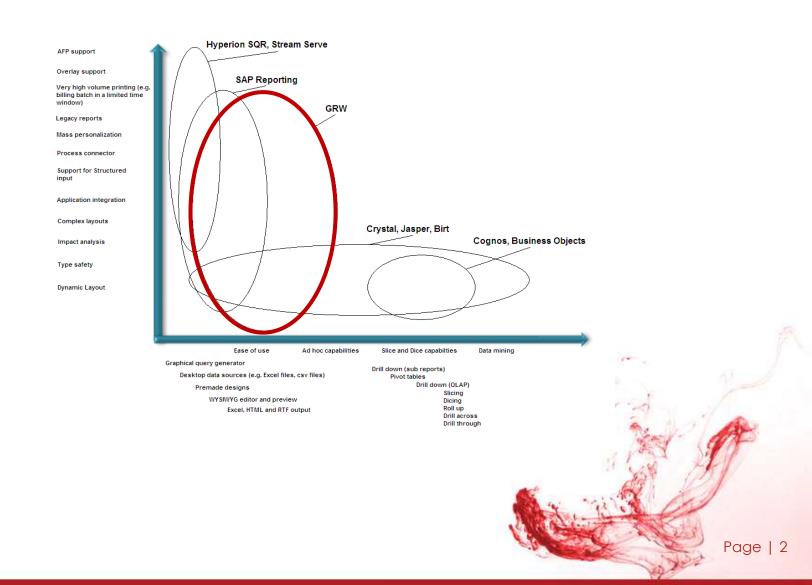
PRODUCT OVERVIEW

March 2015



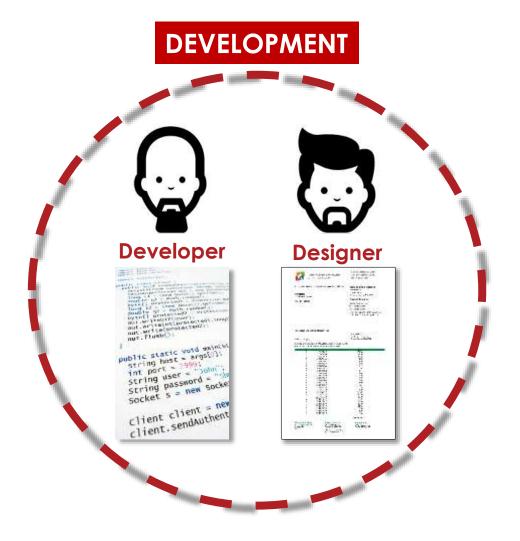


Positioning







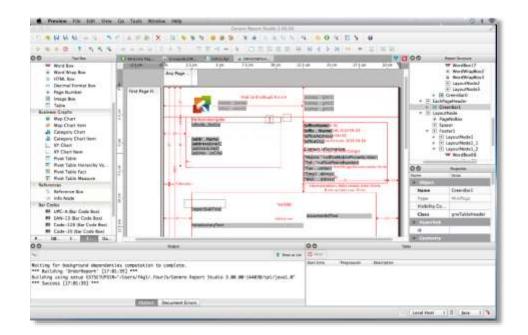


PRODUCTION End-user Page | 3





- Genero Studio (GST)
 - Design report data & graphical layout
- Genero Report Designer (GRD)
 - Standalone designer for end-users & developers
- Genero Runtime Engine (GRE)
 - Execute report via runtime system (DVM)







Key features

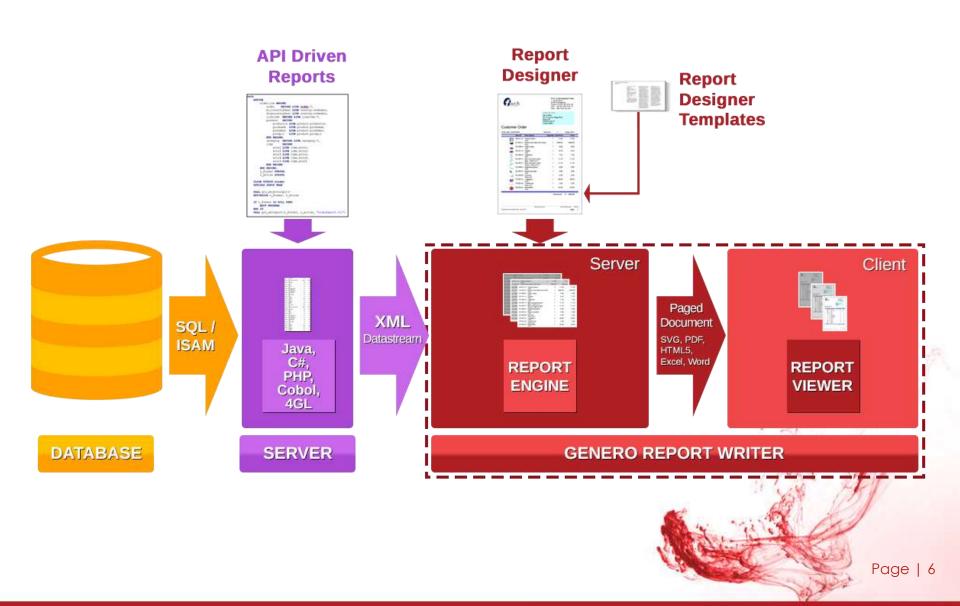
- Enterprise reports
- Streaming architecture
- Scalable
- Dynamic layouting
- API driven
- > Template driven
- Maintainable





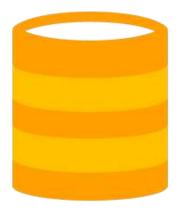


Architecture





Architecture







LANGUAGE



REPORT ENGINE



REPORT VIEWER















Streaming architecture

- Immediate results
 - No temp tables
 - Real-time data
- Fast throughput
 - Simultaneous execution of multiple selects
 - Fast merging of multiple data sources
- Very large reports
 - Reduced resource consumption
 - Uses less disk space
 - Less memory
 - Optimised report management



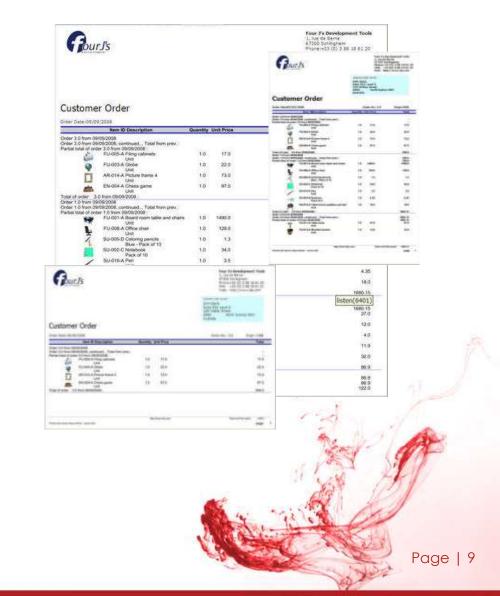






Dynamic layouting

- One report fits all
- Adapts to different:
 - Fonts
 - Field values
 - International languages
 - Paper sizes and orientation

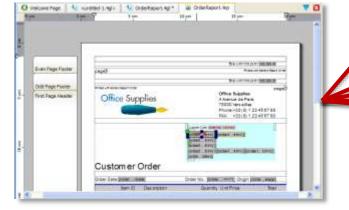


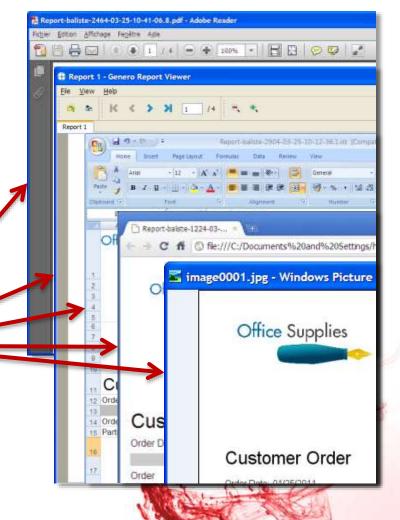




Dynamic layouting

- One report fits all
- Adapts to different:
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 - International languages
 - Paper sizes and orientation







27 King William Ald

Rich Adelach South Ausberg

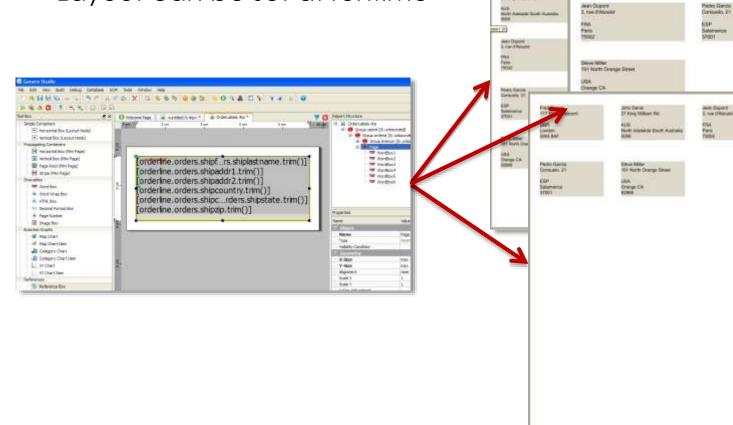
Page | 11



Dynamic layouting

One label fits all

Layout can be set at runtime



TT Size Couled

London Silva BAF





> API driven

- > Java
 - Supports J2SEE & J2EE,
 - Supports JAXB, (Schema generation and marshalling)
- ➤ .Net
 - Supports Xsd.exe/XmlSerializer, (schema generation and marshalling)
- > PHP
 - BAM data source generation.















> API driven

- Java
 - Supports J2SEE & J2EE,
 - Supports JAXB, (Schema generation and marshalling)
- ➤ .Net
 - Supports Xsd.exe/XmlSerializer, (schema generation and marshalling)
- > PHP
 - BAM data source generation.





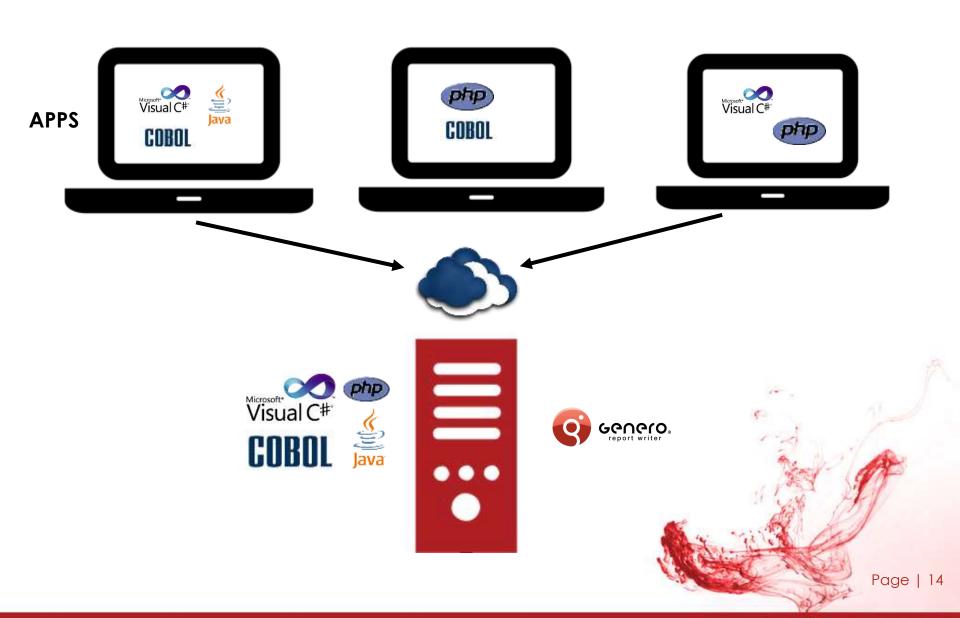








Key features





Cobol and 4GL compatibility modes

- Respects existing report code
 - Same code, new output formats.
- New output formats
 - PDF,
 - Browser,
 - MS-Excel® and MS-Word®.
- Old & new reports co-exist, sharing same output formats
 - Simplify & reduce existing code,
 - Eases migration, works immediately with existing reports,
 - Migrate priority reports first, embellish the rest later.



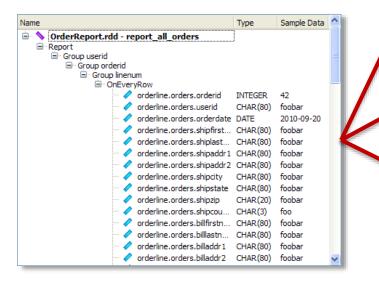


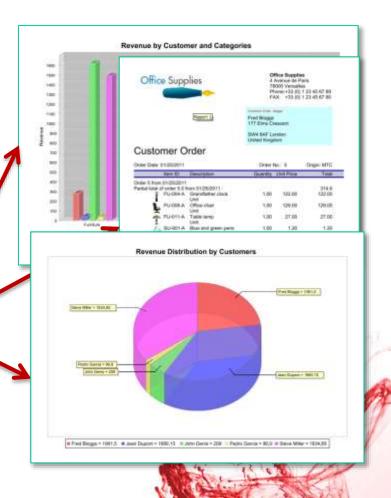


Multiple, simultaneous input data sources

Multiple output formzats from single data source

> Ex: data rendered as table or chart



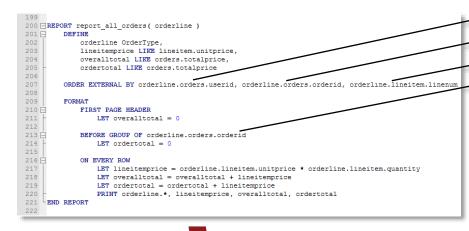


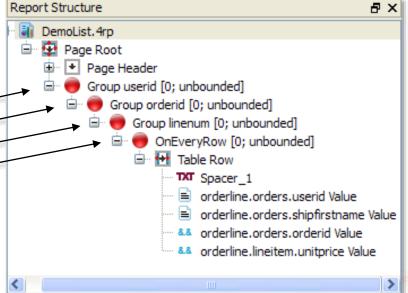


Data sources – 4GL

Schema from 4GL code: REPORT

- RDD schema produced by the compiler (fglcomp)
- PRINT, PRINTX variable
- Iterators and conditional handled (FOR, FOREACH, IF...)
- ORDFR BY





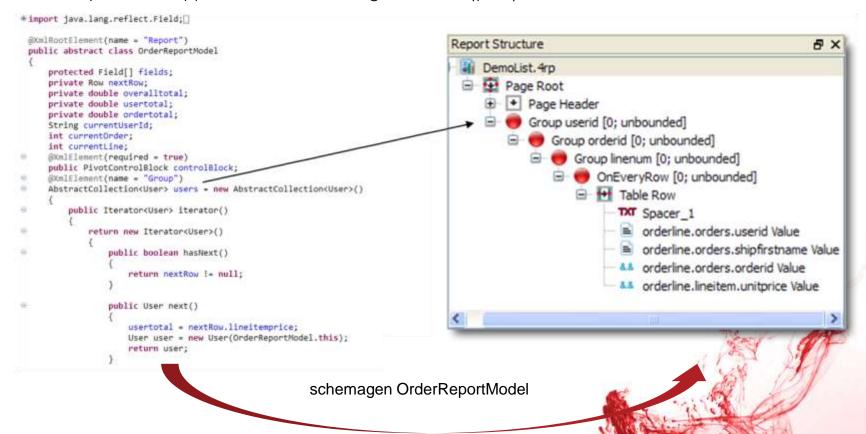
fglcomp -build-rdd OrderReport.4gl



Data sources – Java JAXB

Schema from Java « POJO » object:

- XML-Schema produced by the schema compiler (schemagen)
- Collections are recursively iterated
- Lazy retrieval supported via Iterator using coroutines (yield)

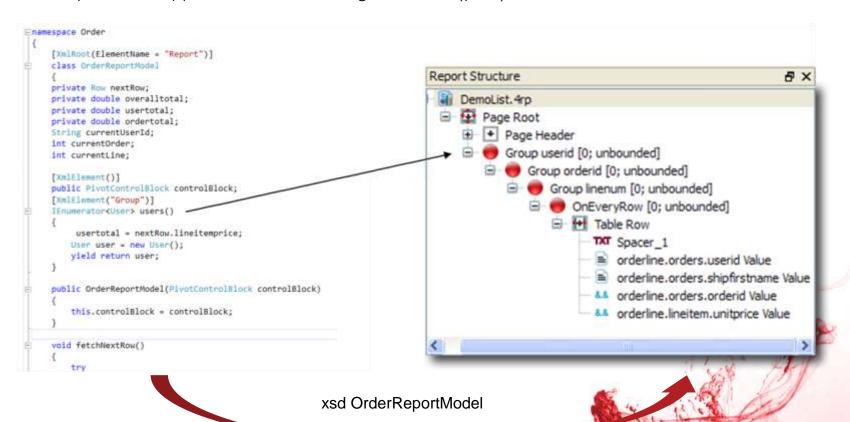




Data sources - .Net, C#

Schema from C# object:

- XML-Schema produced by the schema compiler (Xsd.exe)
- Collections are recursively iterated
- Lazy retrieval supported via Iterator using coroutines (yield)



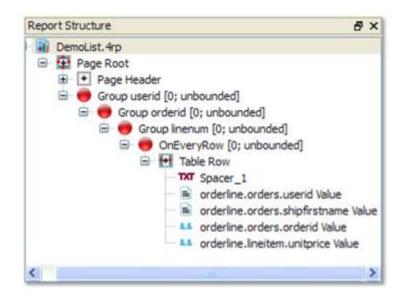


Data sources – PHP generated source & data

Schema from BAM diagram:

XML-Schema produced by the schema generator

```
class Account extends SerializableRecord (
 public faccount_userid;
public faccount_email;
  public Saccount_firstname;
  public Saccount Tastname;
  public function serialize(GreXMLConnector | GreXmlConnector)
    Sfg10b = new FGLOatabase();
  SELECT account_userid as account_userid,
           account.enuil as account_enuil,
           account firstname as account firstname,
           account, lastname as account_lastname
          account
    ifglDb->runQuery(iquery);
while (irow = ifglDb->fetch()) {
      Sthis->setAttributes(Srow);
      parent serialize([greXx|Commector);
  protected function serializeChildren(GreXMLConnector [greXP
    schild = new Orders((this->account_userid);
    Schild->serialize(Spream)Connector);
class Orders extends SerializableRecord
  numblic Sorders_proderid;
  public Sorders userid:
 public Sorders_orderdate;
public Sorders_totalprice;
 private Squery:
   public function __construct(Saccount_sperid) (
    Sthis-> guery -
 SELECT orders.orderid as orders_orderid,
orders.userid as orders_userid,
           orders, orderdate as orders_orderdate,
          orders_totalprice as orders_totalprice
 AND orders.userid="" Saccount_userid.""
```



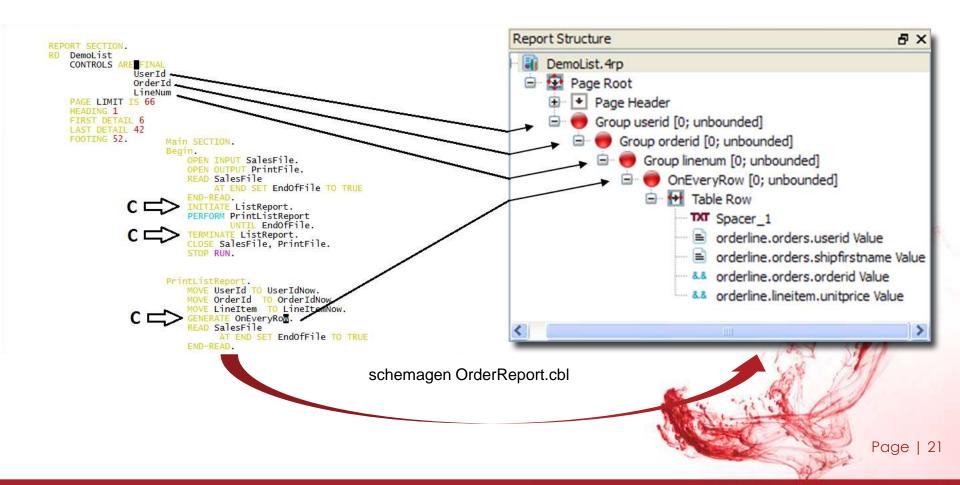
Page | 20



Data sources - Cobol

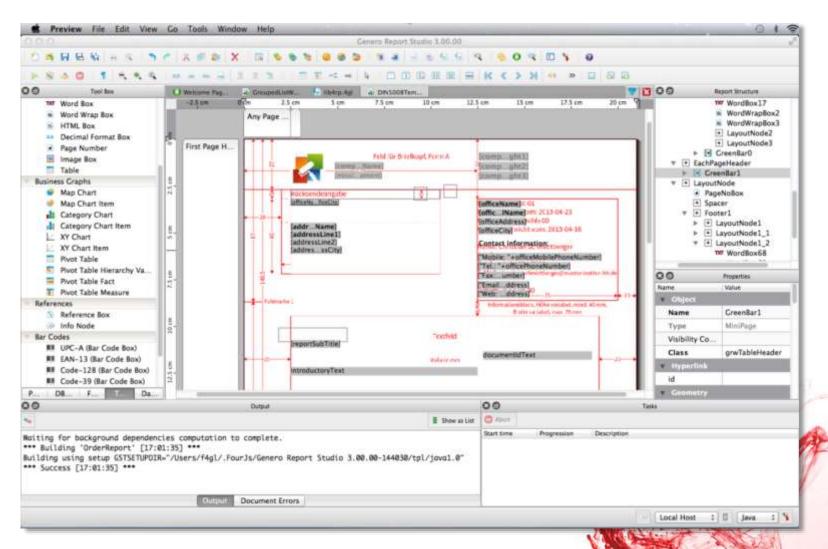
Schema from COBOL code: REPORT SECTION used

- XSD schema produced by schemagen compiler
- INITIATE, GENERATE and TERMINATE instructions remapped to C-Functions
- Groups triggers based on CONTROLS





Genero Report Designer







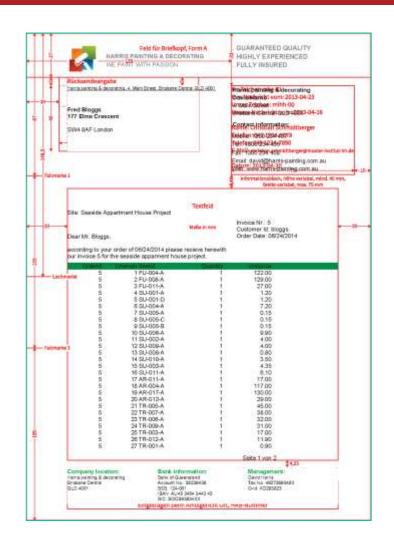
Template driven

- Create report design from templates
 - Design (.4rp) generated from:
 - a template and
 - a data schema.
 - Support for JAXB (schema generation and marshalling).
- Used at design time
 - Generated design can be saved for further mods.
- Command line interface to create the design (.4RP)
- Used at runtime
 - Internally generated design used at runtime.





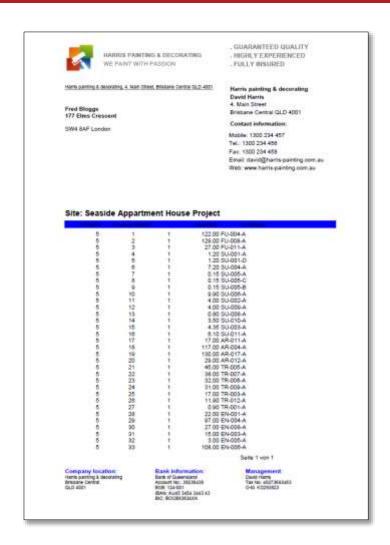
Report templates

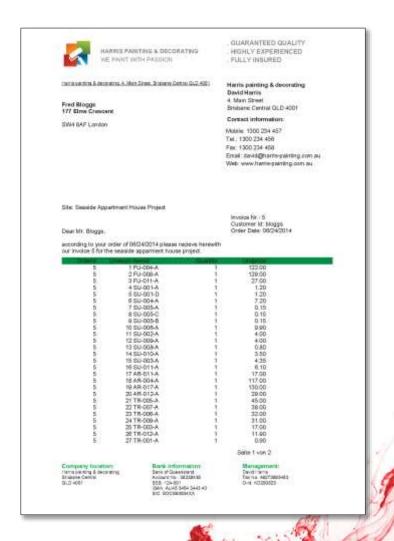






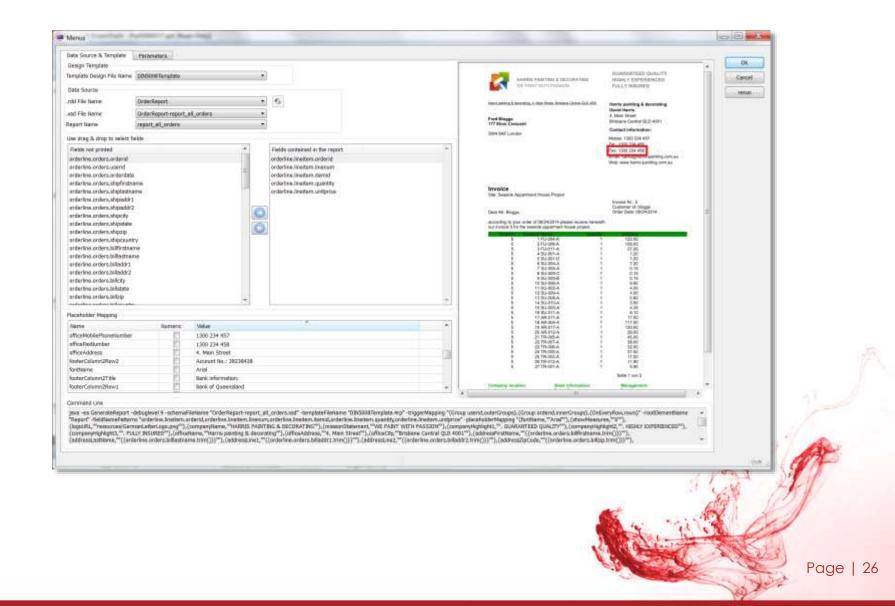
Report templates







Report templates





Report templates – editing templates

Schema based template editing

- Predefined schemas for specific report classes,
- Type-safe editing of templates,
- Easy conversion of reports into templates.

High flexibility

- Template field toolbox object for creation of document objects based on fields,
- Placeholder substitution,
- Support for all types of data representation (e.g. from primitives, tables, pivot tables, charts, etc.),
- Support for groups and typical layouts based on groups,
- Structure of actual data and structure of data in template can differ.



Report templates - samples

	Carrier C	Terramine St	100-200	Unitarios Corred forward	1,173.50
denis		John Denis		Carried forward	11200
3.0		09/30/2014		Calried forward	112.00
Tetal of 8.0	5	4 EW-004-A	.1	97.00	209.00
Tietal of denis.					209.00
duport		Jean Dupont			
1.0	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 FU-001-A 2 FU-006-A 3 BU-005-0 4 BU-002-C 5 BU-010-A 0 BU-003-B 7 EH-010-A	1 1 1 1 1 1	1,486.00 129.00 1.30 184.00 3.50 4.35 18.00	
Total of 1.0					1,880.18
Total of dupont:					1,660.15









Maintainability

- Manage large numbers of reports
- Separation of report logic from presentation
 - Isolate database from external providers
 - Redecorate existing reports
- Version control
- Schema error checking
 - Type safe expressions
 - Schema modifications
 - Design, rather than runtime time discovery
- Template driven





Browser based report viewer

- Pixel exact rendering
 - Exact output as GRV,
 - Text is declared as strings keeping the document small.
- Creation of WOFF fonts on-the-fly
 - Supports all fonts seen by GRE (Type1 and TrueType),
 - Fonts are cached and can be shared between documents,
 - Good performance also for Asian fonts.
- Streaming (progressive) viewing and printing
 - Support of random navigation in unfinished reports.
- Support for very large documents
 - Works well on low bandwidth and/or high latency connections.
- Reports can be bookmarked and shared via URLs



Browser based report viewer - samples

- Calendar
- CategorychartByAreasAndCategories
- CategorychartRevenueByCategoriesAndCusto mers
- <u>CategorychartRevenueByCustomersAndCatego</u> ries
- DynamicPivotTable
- GenericList
- GroupedTableDemo
- ListDemo
- MapchartRevenueByCategories
- MapchartRevenueByCustomers
- MapchartRevenueByCustomersAndCategories

- MasterReport
- OrderLabels
- OrderList
- > OrderReport
- OrderReportASCII
- OrderReportASCII4
- OrderStock
- StaticPivotTable
- TableDemo
- > XYChart



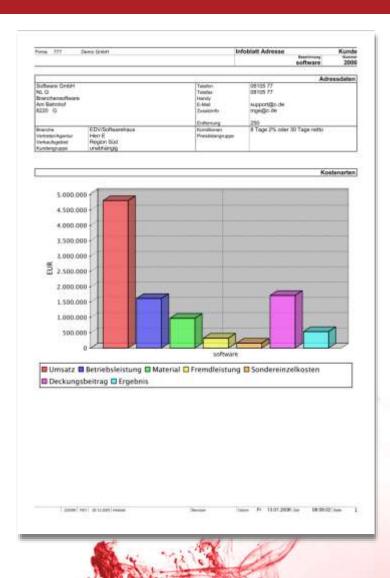




Key features

Report Engine

- Graphic rendering of text reports
- Quick and easy data layout
- Advanced layout
 - Position & size data elements
 - Avoid data truncation
 - Translation & internationalization
 - Design single report for multiple paper sizes



Key features



Report Engine

- XML streamed output
- Low memory consumption
- "Print-as-you-go"
 - Rapid 1st, 2nd, 3rd... nth page delivery
- Print very large reports
 - No need for temp files
 - Merge data/blobs from
 - multiple sources
- Relative or absolute positioning of elements
 - Headers/footers on page breaks
 - Horizontal/vertical box propagation









Hand coded data sources

- Allows reusing existing objects (e.g. JPA/Hibernate classes)
- Enables custom data sources (e.g. web service).
- Requires schema-from-code utility and marshaller to be workable (Available for 4GL, Java and .Net).

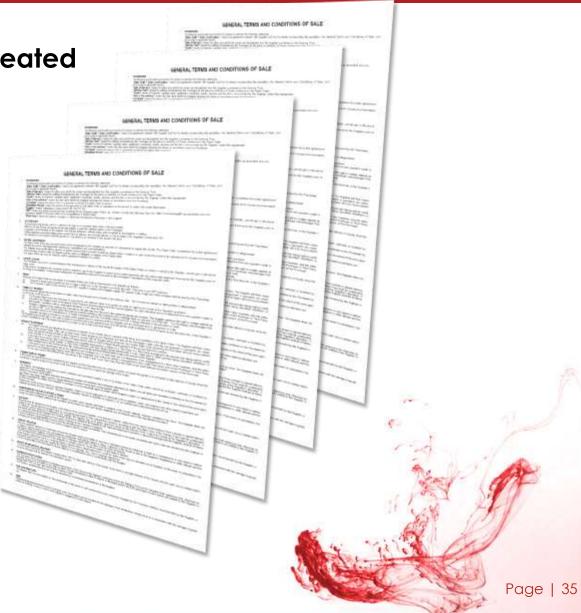
Generated data sources (via. BAM)

- Abstracts language specific details
- Works for languages without schema compiler (e.g. PHP, C, COBOL)
- Enables the creation of identical data sources in different languages.



Reverse side printing

Efficient printing of repeated verso pages





Enterprise class reports – output formats

Output formats:

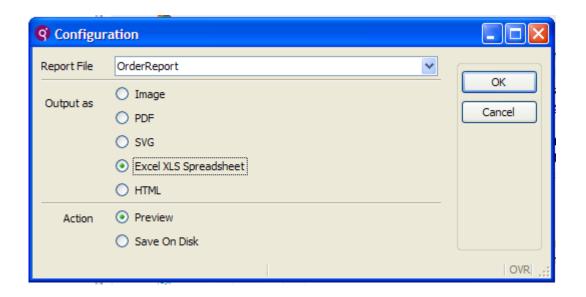
Excel

Word

PDF

HTML

SVG







Enterprise class reports – output formats MS Excel

Excel output

- Output any REPORT to Excel
- Design Excel reports from Report Designer
- Graphical elements rendered as images

1	<u>File E</u> dit <u>V</u> iew <u>I</u> nser	rt F <u>o</u> rmat <u>T</u> ools <u>D</u> ata <u>W</u>	/indow <u>H</u> elp
		<u> </u>	∮ ▶ ▼ (≅ ▼ 🌭 Σ ▼ Å↓ ¼ ∰
A1 ▼ £			
	А	В	С
1		Revenue by Categories and Customers	
2	Insert categories	Customer	Revenue
3	Furniture	John Denis	39.00
4	Furniture	Jean Dupont	1,619.00
5	Furniture	Pedro Garcia	39.00
6	Furniture	Fred Bloggs	278.00
7	Furniture	Steve Miller	1,490.00
8	Office Decor	John Denis	73.00
9	Office Decor	Fred Bloggs	293.00
10	Office Decor	Steve Miller	17.00
11	Entertainment	John Denis	97.00
12	Entertainment	Jean Dupont	18.00
13	Entertainment	Pedro Garcia	32.00
14	Entertainment	Fred Bloggs	272.00
	Entertainment	Steve Miller	32.00
16	Supplies	Jean Dupont	43.15
17	Supplies	Pedro Garcia	4.00
18	Supplies	Fred Bloggs	42.70
19	Supplies	Steve Miller	55.35
20	Travelling	Pedro Garcia	11.90
21	Travelling	Fred Bloggs	175.80
22	Travelling	Steve Miller	40.50

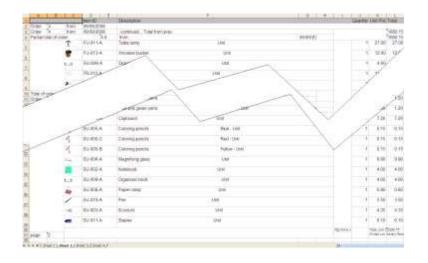




Enterprise class reports – output formats MS Excel

Excel output

- Output any REPORT to Excel
- Design Excel reports from Report Designer
- Graphical elements rendered as images



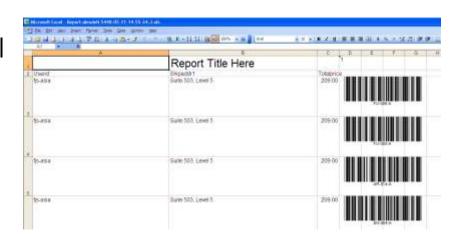




Enterprise class reports – output formats MS Excel

Excel output

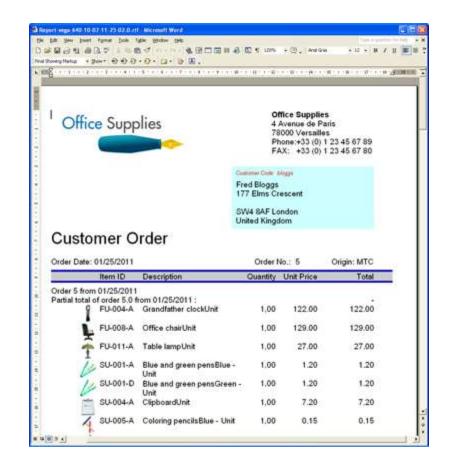
- Output any REPORT to Excel
- Design Excel reports from Report Designer
- Graphical elements rendered as images







Enterprise class reports – output formats MS Word

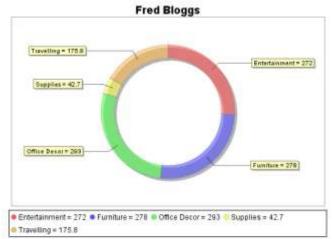




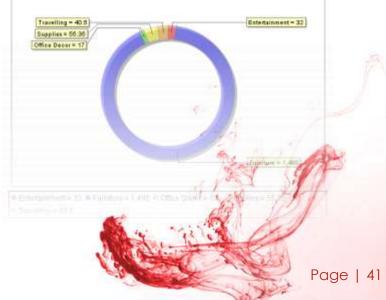
Enterprise class reports – output formats HTML & PDF







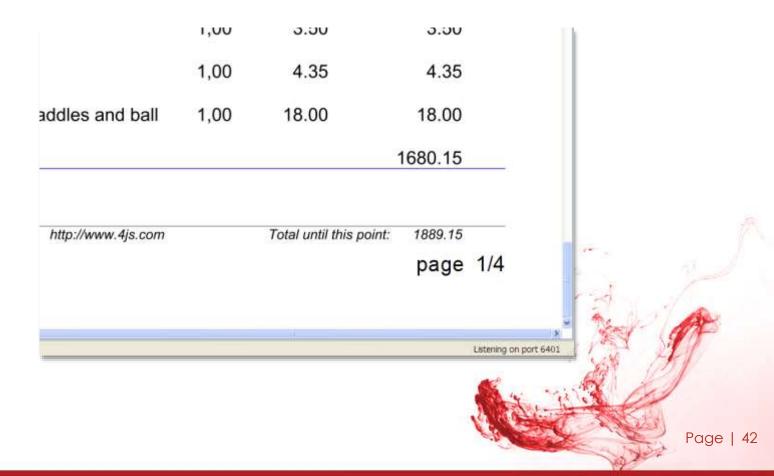
Steve Miller





Enterprise class reports - pagination

- Page 'n of M'
 - 'M' page count for all pages or sub-ranges
 - Display total number of pages 'M' on each page

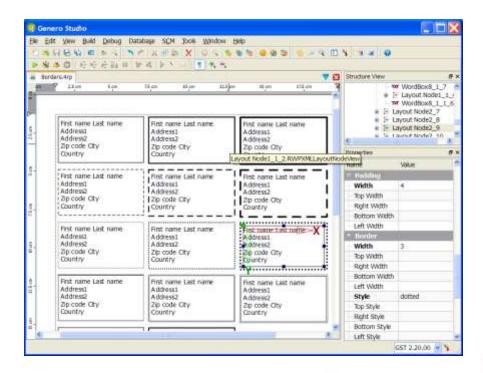


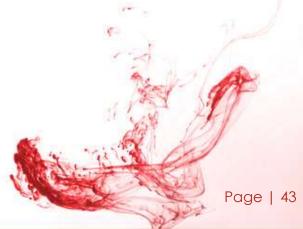


Enterprise class reports - labelling

Borders and padding

- Border style & thickness
- Padding:
 - Defines outer space
- Marging:
 - Defines inner space







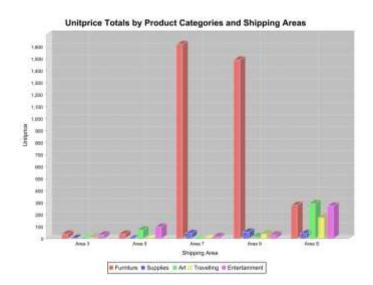
Enterprise class reports – data sources

- XML data sources
 - XML as data
 - XML schema(or DTD) as report data definition
- Report Designer
 - Dataview shows XML schema
 - Report design based on XML schema
- > Third party product integration will use XML data sources





- Charts with multiple dimensions,
- Table with fixed column role types (measure & dimension),
- Table rows known as 'facts'.



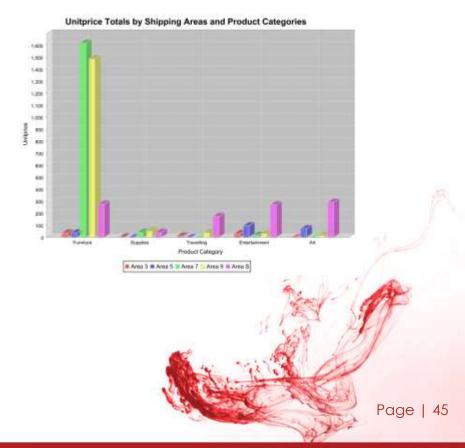
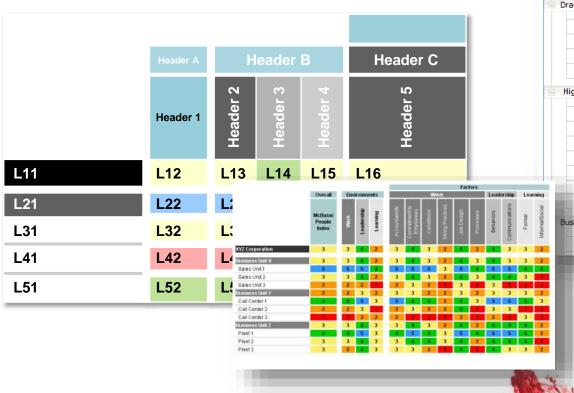
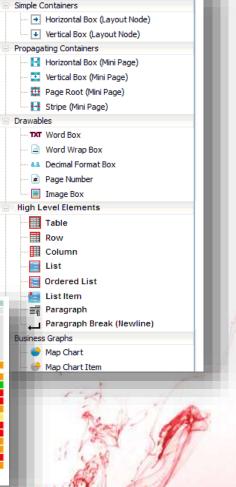




Table layout

Table object manipulates columns, lines and cells for easier formatting and alignment





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Quick response (QR) codes

Hello World: width="3cm"

http://www.4js.com





Hello World: size not specified (default error correction (3))









Sub-reports

Produce REPORT data using sub-reports

Design a single graphical representation

Templates

Store part of the graphical representation in a Template library

Re-use elements of the template library (aggregation)

Parameterized template elements

User defined regions in template elements







Sub-reports

REPORT data using sub-reports
Design a single graphical
representation

Three column sub-report in a 'detail' section. When more data is added, the sub-report will stretch the section downwards adding rows but keeping three columns across.



Thank you



