ReportLab

strategic reporting solutions for e-business

Product Datasheet

Report Markup Language™

The Fastest Route from XML to PDF

Features

Generates PDF documents automatically

- Produces PDF documents for printing, e-mailing, web delivery, or online viewing

Simple XML input

- No need to write scripts, be a programmer or learn an object model
- RML interoperates with XML tools

Powerful Features to Encourage Re-use

- Document Templates
- Stylesheets

Separates 'look' from 'content'

- Dividing a document into "stylesheets", "pagetemplates", and "stories"
- Allows editors and designers to control the look of a document with precision, without interfering with the writers who create its content

Flexibility, powerful formatting features

- Form Widgets
- Barcodes
- plug-in graphics and extensions

Platform-independence

- Desktop, server or embedded
- Windows XP, 2000, NT, 95, 98
- Mac OS 8.x, OS 9.x, OS X 10.x
- most variants of Unix, including Solaris, AIX, Linux

Flexible and Extensible

- Documents can include arbitrary drawings and images.

High Performance

- Complex personalized reports take 1-3 seconds on web servers.
- Generates hundreds of thousands of pages per hour in volume forms applications.

What is Report Markup Language?

Report Markup Language™ (RML) is ReportLab's direct-to-PDF document formatting solution. It addresses key shortcomings in the marketplace for reporting and document generating tools, and has proven itself in demanding mission-critical solutions with some of the world's largest financial houses. And it's the natural reporting tool for XML workflows!

The idea is extremely simple. Developers everywhere have plenty of tools for generating data-driven HTML. We defined a Markup Language which describes the exact appearance of a printed document; and a software component, RML2PDF, which converts RML into PDF files. (We also have some very powerful and simple tools to help generate the RML, in case you don't). In the process, we have made it as easy to generate PDF as it is to generate HTML. This is not only the most flexible solution possible; it's also easy to deploy, and completely natural and straightforward for developers.

RML2PDF is usually used on a web server or other centralized processor to dynamically generate and serve documents over the Web. Developers have a host of techniques available for generating HTML pages including dynamic data, and they can use all of these tools and techniques to generate RML. (Alternatively, they can make use of our own tools and techniques, which are covered in our "Solutions" data sheet). Jobs can be triggered by many means including XML messages, remote procedure calls, programming API calls and CGI requests. Batches of requests may also be generated using scheduled database queries.

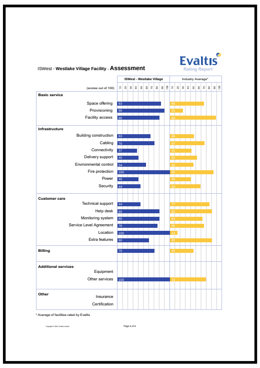
What problems does RML solve?

Traditionally there have been completely separate tools for different kinds of document generation:

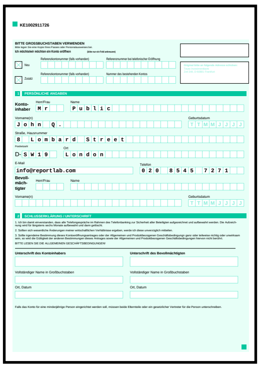
- Long documents: books, manuals, articles
- Desktop Publishing: multi-column newsletters, papers, product catalogs
- Business Forms that need to be completed
- Database Reports with groups, totals, tabular data and basic charts
- Volume "IT Printing" – invoices, bank statements, phone bills
- Custom graphical presentations of data

Report Markup Language can unify all of these fields with a single set of tools, and deliver anywhere needed – in real time on the web, in the back office at month end, or even as an embedded engine in desktop apps. It thereby enables genuine enterprise-wide reporting solutions. The result? Consistent technology, cost savings, and totally new possibilities to deliver the right information to customers.

Personalized Reports - Fidelity Investments



Traditional reports with embedded graphics



Business Forms showing standard form widgets

A Practical, Powerful and Versatile Formatting Language

The RML language has been designed from the ground up to be practical and to meet the needs of enterprise developers. Before talking about dynamic documents, we'll look at the formatting features it offers:

Multiple document models Traditionally, tools for generating books and articles have been totally different from those for generating groups-and-total database reports; and electronic forms are a separate category again. RML is equally happy with the "long document" and "drawing directly on the page" models, and even lets you flip back and forth as needed.

Reuse Has your business ever changed a phone number, letterhead or disclaimer and waited for the developers to patiently make the same changes to a whole family of reports? Or just lived with old or unglamorous output because it is too hard to change? RML separates 'stylesheets' (the paragraph and table styles), 'templates' (the shape and column structure of the pages) and the 'story' – the flowing content. And it allows you to share these, as well as any other section you want to reuse, across a family of reports using an 'include' mechanism. So designers can maintain the corporate style and ensure consistency, and developers can focus on the content. Everything can be restyled globally.

Extensibility RML comes with a powerful object-oriented extension language. This gives you a powerful ASP or JSP-like preprocessor to fill in data variables and control conditional logic; and also lets you write your own plug-in graphics or even extend the basic page layout logic. If the product does not have a feature you need, you or we can add it.

Practical business-specific tags We are not on a quest for theoretical purity, and we will add tags to our language if they are of practical use. The left sidebar shows two examples. Just one tag lets you add barcodes in a variety of symbologies. And to make business forms easy to design, we have special tags for the "textBox", "letterBox" and "checkBox" to create forms like the one at bottom left (zoom in if you are reading this in Acrobat!). These tags can work with shared styles, just like paragraphs and tables, and allow you to globally restyle all form elements. We will add more tags in future whenever there is a consensus that they are useful.

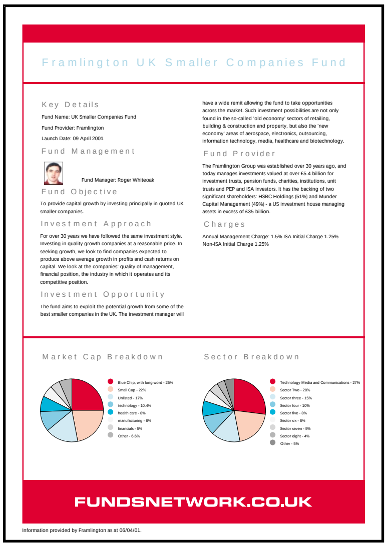
Precision Graphics PDF is a vector graphics format par excellence. If you need to deliver standard or custom graphics within a surrounding document, it is the ideal medium. You can use our drawing tags to create almost any design directly in RML; use standard business charts via our 'plug-in' mechanism, or even write your own using our bundled extension language. We're also happy to work with you to write converters and import filters for other vector file formats. Last and certainly not least, ReportLab's Diagra™ Graphics Server has been designed to interoperate with RML and allows you to create data-driven charts and diagrams to incorporate in your reports, whether singly or in batches.

PDF Specific Features PDF is the de facto standard for electronic document delivery and has a host of useful features. Print formatters aiming for a variety of media can't make the most of what PDF can offer. Using RML and its various add-ons, documents can be encrypted and digitally signed; 'forms' can be declared once and used by reference on each page, giving blazing speed and small files; documents can have live URLs, hyperlinks, navigation tools and hyperlinks; fonts and images can be controlled precisely; and you can even add PowerPoint-style presentation effects!

Free your designers and reuse existing content Our PageCatcher product is a simple add-on to RML which lets you reuse content from any other PDF document. The 'page miniatures' in this document are brought in with a single tag using PageCatcher. This allows designers to create page backdrops and artwork in any tool they wish, and trivially allows existing forms to be filled in. It also makes possible high-speed "document assembly workflows" such as personalized magazines or annual reports: 90% of the content can be predesigned professionally, using RML to stitch this together and insert the dynamic portions. This can offer workflows 10 to 100 times faster than with normal database publishing techniques.

Optimum performance Whether you are trying to generate a rich document while a web user is waiting, or a million personalized statements at the end of the month, speed is critical. RML is fast because it is simple. RML is based on the ReportLab PDF Library, and we directly write the PDF file format with no intervening applications. We expose advanced PDF features such as forms, so that you can include the static part of an invoice once in the file header and just fill in the varying text fields on the next ten thousand pages. We clearly document the performance implications of every feature, from custom fonts to the best use of tables, to let you get the most when you need it. The result? Massively smaller file sizes and blazingly fast runs.

Perhaps most important of all, we believe that we have made all of the features above easy to use and straightforward. Just download and have a read through our manual, or give the evaluation version a try.



Framlington UK Smaller Companies Fund

Key Details

Fund Name: UK Smaller Companies Fund

Fund Provider: Framlington

Launch Date: 09 April 2001

Fund Management

Fund Manager: Roger Whiteoak

Fund Objective

To provide capital growth by investing principally in quoted UK smaller companies.

Investment Approach

For over 30 years we have followed the same investment style. Investing in quality growth companies at a reasonable price. In seeking growth, we look to find companies expected to produce above average growth in profits and cash returns on capital. We look at the companies' quality of management, financial position, the industry in which it operates and its competitive position.

Investment Opportunity

The fund aims to exploit the potential growth from some of the best smaller companies in the UK. The investment manager will have a wide remit allowing the fund to take opportunities across the market. Such investment possibilities are not only found in the so-called 'old economy' sectors of retailing, building & construction and property, but also the 'new economy' areas of aerospace, electronics, outsourcing, information technology, media, healthcare and biotechnology.

Fund Provider

The Framlington Group was established over 30 years ago, and today manages investments valued at over £5.4 billion for investment trusts, pension funds, charities, institutions, unit trusts and PEP and ISA investors. It has the backing of two significant shareholders: HSBC Holdings (51%) and Munder Capital Management (49%) - a US investment house managing assets in excess of £35 billion.

Charges

Annual Management Charge: 1.5% ISA Initial Charge 1.25%
Non-ISA Initial Charge 1.25%

Market Cap Breakdown

- Blue Chip, with long word - 25%
- Small Cap - 22%
- Unlisted - 17%
- technology - 10.4%
- health care - 8%
- manufacturing - 6%
- financials - 5%
- Other - 6.6%

Sector Breakdown

- Technology Media and Communications - 27%
- Sector Two - 20%
- Sector three - 15%
- Sector four - 10%
- Sector five - 8%
- Sector six - 6%
- Sector seven - 5%
- Sector eight - 4%
- Other - 5%

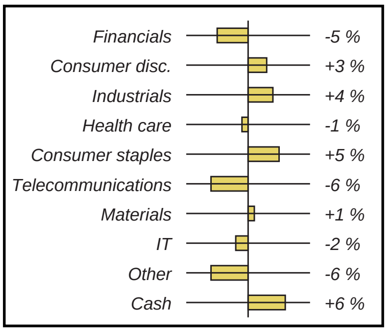
FUNDSNETWORK.CO.UK

Information provided by Framlington as at 06/04/01.

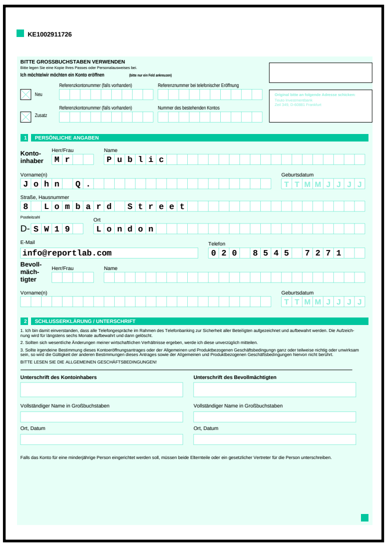
Illustrator-designed background and dynamic content

```
<barCode x="0" y="0"
code="Code128"> AB-12345678
</barCode>
```

Barcodes need just one tag



Precisison Vector Graphics



KE1002911726

BITTE GROSSBUCHSTABEN VERWENDEN
Bitte legen Sie eine Kopie Ihres Passes oder Personalausweises bei.

Ich möchte/wir möchten ein Konto eröffnen (bitte nur ein Feld ankreuzen)

☒ Neu — Referenzkontonummer (falls vorhanden): — Referenznummer bei telefonischer Eröffnung:

☒ Zusatz — Referenzkontonummer (falls vorhanden): — Nummer des bestehenden Kontos:

Original bitte an folgende Adresse schicken:
Teuto Investmentbank
Zeil 349, D-60881 Frankfurt

1 PERSÖNLICHE ANGABEN

Konto-inhaber Herr/Frau: M r — Name: P u b l i c

Vorname(n): J o h n Q . — Geburtsdatum: T T M M J J J J

Straße, Hausnummer: 8 L o m b a r d S t r e e t

Postleitzahl: D- S W 1 9 — Ort: L o n d o n

E-Mail: info@reportlab.com — Telefon: 0 2 0 8 5 4 5 7 2 7 1

Bevoll-mäch-tigter Herr/Frau: — Name:

Vorname(n): — Geburtsdatum: T T M M J J J J

2 SCHLUSSERKLÄRUNG / UNTERSCHRIFT

1. Ich bin damit einverstanden, dass alle Telefongespräche im Rahmen des Telefonbanking zur Sicherheit aller Beteiligten aufgezeichnet und aufbewahrt werden. Die Aufzeichnung wird für längstens sechs Monate aufbewahrt und dann gelöscht.
2. Sollten sich wesentliche Änderungen meiner wirtschaftlichen Verhältnisse ergeben, werde ich diese unverzüglich mitteilen.
3. Sollte irgendeine Bestimmung dieses Kontoeröffnungsantrages oder der Allgemeinen und Produktbezogenen Geschäftsbedingungn ganz oder teilweise nichtig oder unwirksam sein, so wird die Gültigkeit der anderen Bestimmungen dieses Antrages sowie der Allgemeinen und Produktbezogenen Geschäftsbedingungen hiervon nicht berührt.

BITTE LESEN SIE DIE ALLGEMEINEN GESCHÄFTSBEDINGUNGEN!

Unterschrift des Kontoinhabers — **Unterschrift des Bevollmächtigten**

Vollständiger Name in Großbuchstaben — Vollständiger Name in Großbuchstaben

Ort, Datum — Ort, Datum

Falls das Konto für eine minderjährige Person eingerichtet werden soll, müssen beide Elternteile oder ein gesetzlicher Vertreter für die Person unterschreiben.

Dynamic form using special form widgets

The Reporting Pipeline...

Trigger: *reports can be triggered by programming interfaces, HTTP requests or scheduled jobs as needed. The 'trigger' often specifies request parameters.*

Acquire: *reports need to acquire data from many sources. Relational databases, XML files and object models can all be queried as needed.*

Transform: *data needs to be integrated, sorted or prepared for formatting according to your own business rules.*

Validate: *best practice involves checking the data prior to sending out a report; properly logged error reports are better than phone bills which fail to add up!*

Format: *create PDF documents or other formats as needed*

Manage the output: *ensure files are delivered, archived and indexed as needed..*

A comprehensive solution for dynamic documents

Used purely as a formatter, RML is only part of the story. Real documents need loops and conditional logic at the formatting stage, as well as the ability to get hold of and transform data in the first place. Our document "Enterprise Reporting Solutions" datasheet gives an overview of our methodology. In summary, solutions generally involve a top-level script tailored to the customer's needs in a high level scripting language. This ties together standard libraries and components for all stages of the reporting pipeline (see left).

RML comes with a powerful preprocessor, Preppy, which handles all the dynamic aspects of a report. Whichever API you are using, you can create and execute dynamic "templates" which combine static markup with data expressions and business logic. This is conceptually similar to mosty solutions for developing web content, such as JSP, ASP or Cold Fusion. Unlike them, it is not tied to anyone's web server framework, so can be used in command line programs and embedded applications.

Preprocessors are programming languages, and we decided not to invent another mediocre proprietary language. Instead, we selected what we believe to be the best of the cross-platform scripting languages, Python. This has over half a million users worldwide and is ideally suited for data acquisition and transformation as well as embedding in other applications. The preprocessor has constructs for loops, conditionals and expressions, in a syntax which does not overlap with XML, as well as full script tags. The short snippets and expressions are far more readable and less verbose than Java or C, but you have the option to embed substantial scripts such as doing an ad-hoc query in mid-report. Furthermore, Python doubles as the 'macro language' for RML and is used for the controlling scripts in our reporting pipeline.

We've gone to great lengths to make sure that our data models are easy to access within a report. Database data is represented as simple tabular blocks, and XML nodes can usually be accessed with a single readable expression. So business users can usually read and check conditional text rules or define the variables they want to see after minimal training.

The preprocessor 'sees' a data environment which can be passed in from the outside and contain any needed variables. You can thus choose freely how much data acquisition and transformation to handle before the report starts, and how much inline during formatting. Like JSP, templates are compiled on first use or when changes are detected, and create optimized programs designed to output the RML.

Deployment Options

With a footprint as small as 1.5 MB, the ability to run on all platforms, and a number of APIs, RML can be deployed in many configurations and is available through several channels:

Server License The most common use is as a server-side reporting engine. Support and training are available.

Technology Licensing If you are building an application which will be widely deployed, and need a "print engine", RML may be the simplest solution. It can be integrated easily with COM, CORBA, Java, C and most other techniques and the footprint can be as small as 1.5 MB. Contact us with details of your product and market and we will be happy to work out a solution.

Resellers and Integrators Integrators, consulting firms and solutions providers are welcome to contact us. However good the tools, any reporting project requires a solid understanding of the business objectives and the data, and somebody to do the work. You are better placed than us to do this in many cases. We offer attractive margins, a certification program, training, and specialist backup to help you deliver.

Bespoke Solutions Whatever the target hardware configuration, the most successful engagements often involve us or our certified resellers working with the customer to deliver an initial system, training the customer "on the job". Thereafter customers usually find it easy to extend the system and add new reports themselves.

Conclusion

ReportLab is committed to delivering complete, working solutions. Our technology has been driven by hard experience with previous generations of tools; we've worked with it from inception to delivery on mission critical projects; and we are committed to making your reporting solution work.

The Competition: XSL Flow Objects, PDF Libraries and Others

It's hard to define our competition because we overlap with many different kinds of document production. There is not yet a perceived category of "real time PDF reports on the web" – we are among the first doing it, and we believe we are the best. In areas such as back office reporting or database publishing, there are many established solutions, but it depends whether you want to stay in that niche or adopt a solution which cuts across traditional boundaries.

Anyone wanting to compete in our space needs to generate PDF, which means either building a pipeline of applications including Adobe's Distiller Server (at $25,000 per server license), or using a software library that generates PDF. Most contenders can be found at www.pdfzone.com. Among the PDF libraries, we believe the best is Thomas Merz's pdflib (www.pdflib.com). This is mature and accurate, whereas we have found errors or limitations in many others. However, almost all of these libraries let you draw text and graphics on a canvas and no more – there are no paragraphs, tables or tools to help you build a long document. Many of our customers have been pushed hard to find Java-based alternatives and have come back and told us that we have the most extensive features and usable and fast PDF library they have seen.

We invite you to look through the sites of the many companies advertising at www.pdfzone.com, and suggest you apply some basic criteria:

1. speed and stability Try the live demos on their web sites. If there aren't any, suspect something! If there are, compare the formatting features and the speed with our own.

2. customer references Do they give any indication of serious customers using them in demanding environments?

3. open feedback We have a user group of almost 300 members with 2 years experience of our PDF tools. Join the list and ask them what they think.

We are often asked to explain how we differ from XSL Flow Objects. The Extensible Stylesheet Language (XSL) is a published World Wide Web Consortium (W3C) standard dealing with two areas: first, a language for transforming one XML file into another, and second, a language for describing page layout. The original goal was a way to format XML. The first part of XSL – the transformation language – has been a runaway success. Although it is hard to understand at first, good GUI tools are helping programmers and we expect XSL to be the standard in this field. The second part, Flow Objects, is lagging years behind. The foremost implementation, FOP, is a Java program whch converts Flow Objects to PDF; it is part of the Apache Group with backing from IBM. A commercial implementation is available from RenderX.

Too General The Flow Objects specification aims to handle all languages and all media. This means layers of indirection everywhere to allow for left-to-right and right-to-left text mixed freely in the same sentence, full Unicode support and more. This means that anyone trying to produce a conforming implementation has formidable hurdles to climb. More importantly, FOP aims to output PDF, Rich Text Format and many other fundamentally different page layout models; we have a simpler, faster product because we are aiming straight for PDF and can concentrate on exposing PDF features.

Too Verbose The book "Inside XSLT" (Steven Holzner, New Riders 2001) covers Flow Objects in depth. Example 11.5 in that book shows how to format a simple table, which is shown on the left. We defined that table in 10 lines of RML. The Flow Objects version is 103 lines long and frankly hard to read. And four lines of our definition are a reusable table style which would be common to all such tables in a real report.

Name	**Mass**	**Day**	**Radius**	**Density**	**Distance**
Mercury	.0553	58.65	1516	.983	43.4
Venus	.815	116.75	3716	.943	66.8
Earth	1	1	2107	1	128.4

A simple table takes 10 lines in RML (of which 4 are a reusable style) and 110 in XSL Flow Objects.

Focused on Long Documents XSL-FO is aimed at 'text documents' – articles, books and stories with a single 'text flow'. Doing anything else rapidly becomes complex. On the first page we showed three different document styles. Flow Objects would be quite good at the first, troublesome for the second, and mind-bendingly difficult to apply to the third. RenderX have an experimental demo of how to generate a barcode in XSL, which requires about 40k of code; we just give you the barcode tag!

Too Slow Most of the XSL tools are based on Java. Our own tools are a mixture of a high-level language (Python) and C, and we profile and rewrite the speed-critical parts in C, so we can both develop quickly and run quickly.

In short, we believe that XSL-FO is likely to emerge slowly as a route for formatting longer documents – especially the printed editions of software manuals or Javadoc-style referenced documents– but is not a practical tool for many classes of real-world reports.

Features	Benefits
Generates PDF documents automatically	
Produces PDF documents for printing, e-mailing, web delivery, or online viewing	● predictable results for both, viewing and printing ● no more hassles with printing HTML documents ● complete layout control ● total control over positioning content – down to fractions of a point ● crisp vector graphics
Simple XML input	
No need to write scripts, be a programmer or learn an object model	● RML is an easily understood XML dialect, similar to HTML ● Extensive documentation and examples combined with excellent support help the designer
RML interoperates with XML tools	● RML is a genuine XML language with a DTD – not just something with "XML-like syntax" ● Create and edit RML text using validating XML editors ● Generate RML from XML tools like XSLT ● Write transformation filters from other vector graphics languages
Powerful Features to Encourage Re-use	
Document Templates	● Define 'page templates' with completely arbitrary text columns and graphics ● Share templates across a family of reports. A global change – whether a new office phone number or a complete redesign – takes effect across a family of reports instantly
Stylesheets	● Paragraph and table styles are declared separately to the story. Look and feel can be controlled by designers; content creators only worry about content
Separates 'look' from 'content'	
Dividing a document into "stylesheets", "pagetemplates", and "stories"	● Groups of documents can share centrally administrated style features ● Fixed page annotations are independent of "flowing" page content
Allows editors and designers to control the look of a document with precision, without interfering with the writers who create its content	● Give stylistic control to artists ● Let business people control the paragraph text. ● Have administrators or programmers control the technical issues ● All done independently
Flexibility, powerful formatting features	
Form Widgets	● Standard tags for checkboxes, textboxes and letterboxes make it easy to create business forms
Barcodes	● Create barcodes with a single tag – no external applications
plug-in graphics and extensions	● 'plug-in' tags let you call out to a comprehensive macro language to use our pre-built chart objects or create your own graphics

Platform-independence

Desktop, server or embedded	● Deploy on all common server and desktop platforms ● License as an embedded print engine for other applications
Windows XP, 2000, NT, 95, 98	● The same installation works seamlessly on all Win32 platforms ● Unix and other installations share the same code base as Win32 ● Develop on a Windows Desktop and install on a Unix server
Mac OS 8.x, OS 9.x, OS X 10.x	● The Mac is the preferred platform of designers and publishers ● Use the platform of your preference ● Mix and match platforms for development testing and production
most variants of Unix, including Solaris, AIX, Linux	● No need for additional hardware purchases ● No need for complicating your IT hardware landscape to add a reporting capability ● Reduced training and administration costs

Flexible and Extensible

Documents can include arbitrary drawings and images.	● include photos, bar charts, line graphs, engineering diagrams, maps, tables, diagrams and multicolumn page layouts. ● include graphics or whole pages from other PDF documents. ● include graphics or whole pages from other PDF documents. ● included forms can be "filled in."

High Performance

Complex personalized reports take 1-3 seconds on web servers.	● No subprocesses required. ● No dependency on other licensed software.
Generates hundreds of thousands of pages per hour in volume forms applications.	● Supports "sharing" of repeated layout features between pages. ● Repeated complex elements can be "stored" once and "reloaded" many times.

Who should use this?

- Web publishers creating rich, database-driven websites that are scalable, easy to maintain, and support multiple languages.
- Creative professionals developing asset management solutions and multimedia workflows.
- Educators deploying e-learning applications such as distance learning, on-line course catalogs and student records management.
- Businesses needing to rapidly develop flexible and scalable e-commerce solutions.

System Requirements

- There are no special hardware requirements. ReportLab will liaise with you to determine the best deployment techniques for your platform and environment.
- We build and install as needed on Unix platforms; standard installers are available on Windows and Mac.

Support and Related Services

ReportLab offers support directly or through a network of trained resellers and consultants. 24x7 support is available for critical server installations. Successful support involves site analysis, staff training, and continual review of performance against targets.

We can log in remotely to debug, upgrade or maintain your systems, and will make site visits where feasible.

We offer training as needed. The best approach is usually for us to deliver an initial application, then to work together with your staff to transfer both development and support skills, until you can develop new applications without depending on us.

All products come with comprehensive illustrated manuals and numerous examples.

The Making of...

These datasheets and white papers are, of course, generated from ReportLab's own software. Here's how we do it:

- we defined a little XML document type to hold the required information for product datasheets and white papers.
- we are then free to use many of the excellent XML editing tools such as XML Spy (www.xmlspy.com) to input the data. These check that the data complies with the required format as you type.
- we designed a template in a mixture of static RML and short dynamic expressions in our PREPPY preprocessor (much like JSP or ASP). This is compiled on first use (or whenever the design changes) into a program which can merge the dynamic input and create a "fully-expanded" RML document.
- drawings and charts come from our Diagra Charting and Graphics framework. As well as generating crisp vector drawings in PDF, Diagra can output EPS for professional publishing and bitmaps for the web.
- any "page miniatures" you see are brought in using our PageCatcher product, which lets us import existing content from other PDF documents. A single tag in the input tells it which page to load from which PDF. These are the exact pages from the sample application – zoom in and look! *(This does make the PDF files larger)*.
- RML2PDF then converts the fully expanded RML into a PDF document.

The program can be run on demand, but is also run on our web server each night to regenerate all the documents. And we could easily produce HTML versions from the original XML if we wished.

For More Information

For technical, sales or developer information, either contact the addresses below or send email to info@reportlab.com.

ReportLab Europe Ltd
Media House, 3 Palmerston Road
Wimbledon
London SW19 1PG, UK
Tel: +44 (0) 20 8545 1570
Fax: +44 (0) 20 8545 1571
www.reportlab.com
info@reportlab.com