The Challenge of Timely Report Delivery
The UCR Office of the Vice Chancellor University Advancement (VCUA) relies on the availability of timely reports in order to fulfill its advancement, fundraising, and communications related missions. The VCUA possesses expert level knowledge of Crystal Reports and the various donor databases and tables it relies on for information, but over time, their method of sending reports as email attachments became burdensome and no longer viable due to time and security concerns. In 2009, the VCUA approached Computing & Communications (C&C) for a delivery solution that would NOT require ANY NEW resources or funding and that would automate the process of a programmer / analyst writing a report in Crystal, running it on the desktop, and sending it out via e-mail.

In just a few months, C&C developed the VCUA Report Gateway using standard campus technology integrated with the UCR portal, R’Space – with no change in the way VCUA creates reports. With no significant learning curve and no incremental cost, C&C used its knowledge of web services and the Microsoft .NET Crystal Reports “wrapper” to facilitate accurate and timely report delivery (24x7) for VCUA. This solution allows any other department, unit, or campus to leverage their existing expertise and deploy reports to its users or customers.

"Working closely together for more than a year (and even today!), the team has built, tested and deployed more than two dozen live reports designed to assist Advancement administrators and development officers in easily and accurately tracking progress of Advancement as a whole as well as progress of individual units."

-- Judy Lehr, Donor Research & Relations and Gift Administration
University Advancement Report Gateway features:

- Innovative use of technology resulting in timely and accurate reports in pursuit of Fundraising
- Ease of use for development officers and university executives
- Seamless integration with the UCR campus portal, R’Space
- Large time and effort savings in creating reports and making reports available in Word, Excel, PDF, Rich Text or Crystal Reports format
- Adoptable by other UCR units / organizations and other UC campuses

Overview:

Everyday, development officers at the University of California, Riverside seek to increase the university’s fundraising potential. Development officers need to understand donor propensity, giving levels, campaign effectiveness, pledge counts, and overall donations to the university. Obtaining this information in an easily formatted, specially designed report is essential to all development officers in their quest to solicit funding and gifts for the university. To meet this need, Computing & Communications and the Office of the Vice Chancellor for University Advancement created a one-stop-shop for generating these reports on-the-fly. The result has been a steadily growing repository of reports ranging from “Professional School Student Support” to “Four-Week Rolling Gift & Pledge Count.”

To date, the University Advancement Report Gateway contains the following reports:

- Dollars by Gift Level in 000's (CAE Standard)
- Five-Year Giving - Individual vs. Organization
- Five-Year Giving by Constituent Code (CAE)
- Five-Year Giving by Donor Level (CAE)
- Five-Year Giving by Unit (CAE)
- Four Week Rolling - Gift & Pledge Count (UC Standard)
- Four Week Rolling - Gift & Pledge Dollars (UC Standard)
- Gifts of $25K and Above (CAE Standard)
- Individual College Student Support
- Non-Professional School Student Support
- Professional Schools Student Support
- Relationship Coordinator – Proposal Action Summary
- Relationship Coordinator Solicitation Status
- Unrestricted Annual Giving (Cash) (CAE Standard)

“In early 2009, University Advancement and Computing & Communications began a first-time collaboration. The goal was to make web-based Advancement reports available through what would be called the University Advancement Report Gateway. We envisioned that it would work like the UCRF Financial Reports.”

Page 2 of 8
Working closely together for more than a year (and even today!), the team has built, tested and deployed more than two dozen live reports designed to assist Advancement administrators and development officers in easily and accurately tracking progress of Advancement as a whole as well as progress of individual units. The portal is hosted on R’Space and is cooperatively maintained by Advancement and Computing & Communications staff.

[C&C] has been and continues to be a responsive and involved partner in this innovative venture.

-- Judy Lehr, Donor Research & Relations and Gift Administration

Project Highlights:

- Secure access to fundraising actions and results for all UCR development officers
- Web-based access to 13 reports available to all development officers 24x7
- Report data updated automatically each day from Raiser’s Edge Data Warehouse
- User Authentication via CAS and Authorization via security profiles from The Raiser's Edge
- Utilizes campus core technical competencies - native Crystal Reports expertise (University Advancement) and Oracle PL/SQL (Computing & Communications)
- Extensive user support site

Report Generation User Experience:
Authorized users can quickly and easily generate reports by logging in and making a few simple choices. The process is as follows:

1. The user logs in to the R’Space Staff Portal and follows the link for University Advancement Report Gateway.
2. The logged-in user chooses a report to generate and enters the required report parameters.

3. The report is generated based on user input.
4. The report is presented in the web browser as PDF, Excel, HTML, Word, or Crystal Report format.

User Support:
The University Advancement Report gateway is accompanied by a user support site, providing users with information regarding:

- Best practices and preferred web browser settings (reports work in all web browsers)
- How to obtain access to the system
- How to use the report tools
- Expected report performance (i.e. expected report generation time for each report)

The support site is available at: http://cnc.ucr.edu/vcuarg/
Technology and Implementation:

Report Generation Technical Details:
Each report available from the Report Gateway is a combination Crystal Report file, Oracle Database and PL/SQL web form, and a Windows Server-hosted Microsoft ASP.NET “wrapper.”

1) Crystal Report File
The UCR Advancement staff utilizes their expertise of the Crystal Reports software to create a Crystal Report file. This file contains all of the data required to display the report at runtime. Each report file is given a name such as Five_Year_Giving.rpt. Each Crystal Report file is copied to a special directory on the Windows Server.

2) Oracle Database and PL/SQL web form
The web-based interface (user-facing) is built on an Oracle database with Oracle’s procedural language, PL/SQL. The Oracle database drives the report gateway and holds the following:

a. PL/SQL generated html pages and forms.

The PL/SQL generated html pages and forms display report choices to the user and also display Help pages for each report.

b. Database tables to hold data about the reports.

The Oracle database tables contain each report name, report description, parameters, format types and help text. Report Parameters may be a) entered by the user, such as a date or date range, or b) provided as a validated list of static values for the user, such as Disbursing Units, or c) provided as a validated list of dynamic values derived from a query made to the Data Warehouse. The format types allowed for each report are stored related to each report name in the database.

When the user clicks the Run Report button, the PL/SQL form submits the form parameters for the chosen report to an ASP.net aspx file hosted on the Windows Server. This file generates a unique file name for the report and sends the filename back to a PL/SQL function in an Oracle stored procedure. (Step 4b in Figure 1 below)

The web interface then displays a “generating” page to the user while the report is being generated. During the process below, this page continually checks for the final report (stored in the Oracle database, until a report file name and success status is found.

3) Microsoft ASP.NET “wrapper”
On the Windows server, a call is made to a special “wrapper” .Net library (provided by Crystal Reports vendor SAP Business Objects ®) which supports the automated execution of Crystal Reports.

A new Crystal Report Object (consisting of .NET DLL files) is created for the chosen report and opens the report file (Five_Year_Giving.rpt) to compile the parameters, and add the parameters to the report object. This object is granted read-only access to the Raiser’s Edge Data Warehouse.

Within the DLL the “Export to Stream” function is called, which takes in the output format parameter (HTML, PDF, etc.) and the report object (report object contains the report name, and report parameters) and generates a stream, storing the final generated output to memory. (Step 4d in Figure 1 below)
The completed report is inserted into the Oracle database Documents table (via ODBC) as a byte array and the final report filename and status (completed Yes/No) is stored in the Finished_Reports table. (Step 4e in Figure 1 below)

The “generating” page being displayed to the user then finds the final report in the Finished_Reports table and looks in the Documents table for the final report to display.

The final report is then displayed to the user in their chosen format. (Step 5 in Figure 1 below)

Diagram of the Report Generation Process

![Diagram of the Report Generation Process](image)

Figure 1. The report generation process, inputs and user flow.
Project Timeline:

September 2, 2009  Project kick-off
November 2, 2009  Demonstration of Report Gateway to Key Stakeholders
December 8, 2009  Report Gateway Testing Phase begins, training provided to test users
February 12, 2010  Completion of Testing Phase, User Training
February 19, 2010  Launch of Report Gateway to all authorized users

Project Team Members:

Computing & Communications
- Eric Martin
- David Gracey
- Bob Ayers
- Brandon Ayers
- Conley Read

Advancement & Institutional Support Services
- Lisa Watson
- Joe Parent
- Iris Tam
- Yulduz Akhmedzanova

Donor Research & Relations and Gift Administration
- Judy Lehr
- Robert Weiner (Robert L. Weiner Consulting)

Submitter’s Name, Title, and Contact Information:
Eric Martin, Project Manager
University of California, Riverside
Computing and Communications
(951) 827-6424