R SYSTEMS
Caring - Innovating - Transforming

Healthcare Analytics

Health Information Exchange
Predictive Analytics Interoperability
Population Health Management
Patient Engagement m-Health
Remote Care Management
Privacy & Security Cloud Computing

CMMI Level 5 PCMM Level 5

HealthCare Business Analytics – Enterprise Priorities

- Most CIOs and executives understand that Big Data & Analytics is changing their industries' landscape
- Business leaders are increasingly aligning the data for the following business priorities:

- Ability to get the data
- Lack of understanding how to use analytics to improve business
- Lack of skills internally in the line of business
- Don't know where to start
- Ownership of data is unclear or governance is ineffective
- Concerns with data
- Perceived cost outweigh the projected benefit
- Lack of management bandwidth due to competing priorities

Monetizing data is everybody's TOP AGENDA today!

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How Rsystems helps – Our Offering

Our **Health Care Analytics offering** enables ***health care providers, insurers & managers*** to leverage structured & unstructured data for:

R Systems Healthcare Offering

Health Care providers

Improving Clinical & Operational Effectiveness

Health Insurers

Reducing financial Risk

Medical Equipment

Maintaining device reliability & Uptime

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Analytics for Insurance Providers

- Increase revenue and ROI
- Improve utilization
- Optimize supply chain and human capital management
- Improve risk management and regulatory compliance
- Reduce fraud and abuse
- Increase operating speed and adaptability

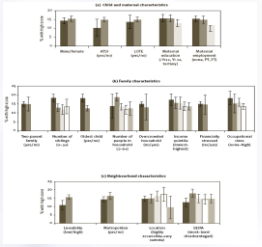
Geo - Demographics

Lifestyle

Enrollment & Claims

Customer Interaction

Member Analytic Record



Cohort based Analysis & Insights

Risk Assessment & Fraud Models

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Analytics for Healthcare Providers

Health care providers the world over are feeling the pressure to reduce avoidable readmission rates & improve patient outcomes. R Systems can help Improve Quality & Outcomes by:

- Helping reduce **re-admissions & improve health outcomes** by analyzing vast structured & unstructured clinical & operational data.
- **Optimizing health care cost** via analysis of millions of transactions on patient care across demographic, lifestyle & condition/procedure cohorts.
- **Accurately forecasting demand for services and workforce supply**, and develop critical workforce plans to mitigate any predicted gaps.

Domain Expertise → **Best in class analytics solution** → **24X7 Analytics services**

Increase revenue & Improve Clinical Outcomes

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Analytics for Healthcare Equipment Providers

R Systems Internet of Things (IoT) Analytics offering can help healthcare equipment providers:

- ❑ **Monitor the usage** of sold or leased medical equipment.
- ❑ **Correlate sensor data** for issue identification, preventive maintenance & reducing downtime.
- ❑ Leverage insights for product & service customization.

R Systems Solutions framework for Acquiring, Processing & Analyzing sensor data*

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Voice of Patient & Web Analytics

Speech Analytics

- Reduce time to gain insights from recorded calls
- Realize ongoing business value
- Optimize Patient engagement

Text Analytics

- Gain structured insights into unstructured text
- Deep dive insight into Patient sentiment
- Auto categorize and organize texts into relevant categories

Feedback Management

- Centralize survey responses
- Unify siloed approaches, disparate systems to facilitate better, more informed business decisions

Feedback Management (IVR)

- Context based approach
- Better Patient engagement to get their views

Patient Engagement Analytics

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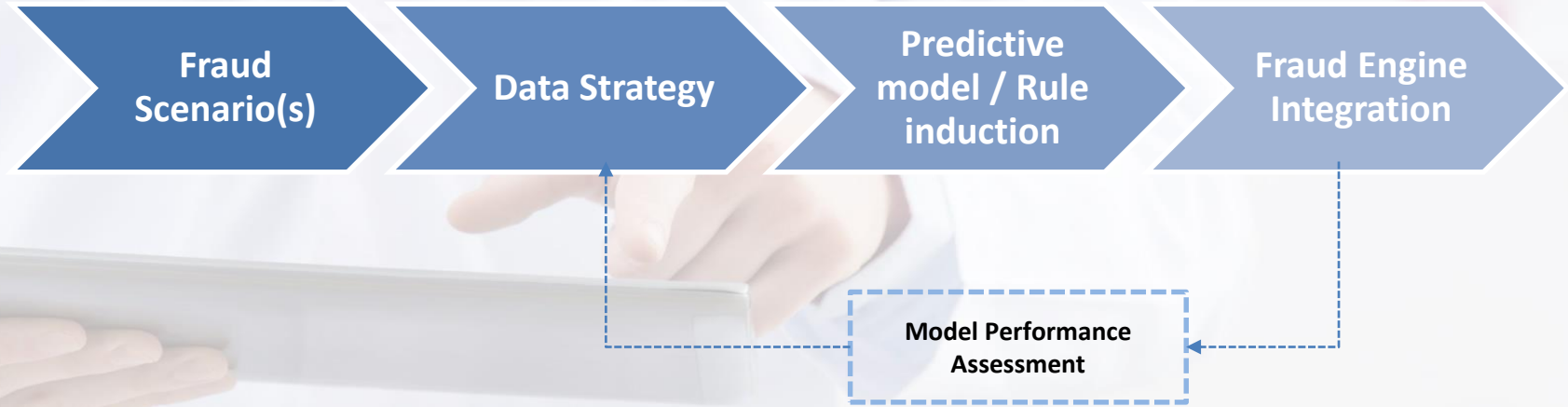
Fraud Analytics

- R Systems fraud analytics offering can help you build and update your fraud intelligence at a faster rate & lower cost.
- Advanced machine learning algorithms used for modeling and rule induction.
- Closely work with Fraud management team(s) to access system/model performance post implementation.
- Maintain model repository for future reference & control



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Analytic Capabilities - Value Proposition

- Improved insights into Customer acquisition and retention process and reduce Churn
- Better customer experience, product cross sell by applying advanced clustering techniques
- Predictable sales process focusing on winning deals
- “Quote-to-Cash” model for predicting revenue realization
- Optimized Product engagement meter by statistically developed Customer Loyalty index
- Enterprise wide Risk Scoring model to improve Customer satisfaction

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Analytics Intelligence Tools Expertise @ RSI

Microsoft Business Intelligence

ORACLE
BUSINESS INTELLIGENCE

tableau
SOFTWARE

pentaho
open source business intelligence

MicroStrategy

informatica

QlikView

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Health Care Application Expertise for Analytics

homecare homebase
Empowering Exceptional Care™

aprima®
EHR ♦ PM ♦ RCM

salesforce

NETSUITE

BRIGHTPATTERN

Microsoft Dynamics

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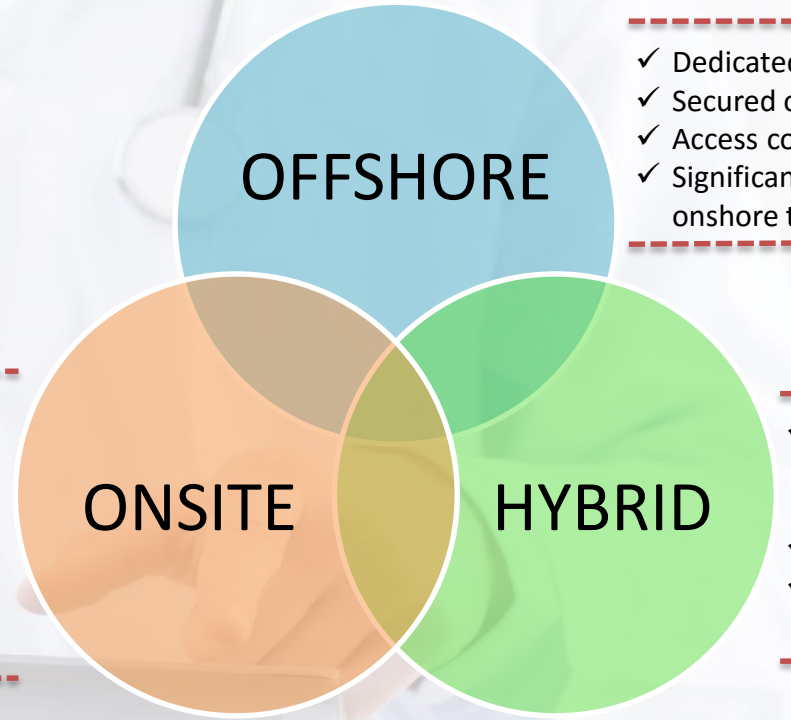
Our Service Arrangements

Elastic engagement model customized for client needs



- ✓ Dedicated onsite engagement manager.
- ✓ Secured offshore data environment.
- ✓ Access controlled bays for client delivery.
- ✓ Significant work timing overlap with onshore team.

- ✓ Resources collocated in client's premises.
- ✓ Close interaction with client's team for delivery.
- ✓ Close supervision and support from Practice head and Client partners.

- ✓ Hybrid model optimized for reducing cost and maintaining high level of engagement.
- ✓ Ensures 24 x 7 delivery.
- ✓ Access to R Systems infrastructure to scale analytics operation.

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Predictive Model for Contract Renewal & Churn Reduction

Client

A major US based Telecom company which is focused on providing various internet, security products and managed services to Fortune 50 companies.

Business Objective

To leverage machine learning algorithms for predicting which customers would renew contract from historical internal and external market data.

Solution

- Implemented a Multilayer Perceptron (Neural Network) algorithm for predicting a list of customers who would sign the renewal contract .
- Generated a list of potential to churn customers.
- Algorithm currently being implemented as a pilot project.
- 82% model accuracy and there was a 40% reduction in churn following the model output.

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Predictive Risk Scoring Model

Client

A major US based Telecom company which is focused on providing various internet, security products and managed services to Fortune 50 companies.

Business Objective

To leverage decision tree algorithm to assign a Risk Score generated from historical internal data to each customer in a segment which is being used by Sales for effective pricing, Operations to provide better service.

Solution

- Implemented a decision tree algorithm using IBM SPSS statistical modeling tool to assign a Risk Score on a scale from 1-10 in a specific customer segment.
- The model is rerun every month with addition of incremental set of data to update the Risk Score.
- Algorithm has been implemented in production.
- 4% increase in NPS by improved customer service and 37% increase in deal close rate with better pricing strategy.

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Success Stories (Health Care Clients)

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Case Study - Health Essentials

About Health Essentials

Health Essentials is a full-service organization that has been providing care to the frail elderly population in California, Arizona and Nevada since 1996. Family of companies includes a physician-led medical group, three Medicare-certified and CHAP-accredited hospices, pharmacy services and a durable medical equipment (DME) provider. By offering all services under one organization, Health Essentials provides its partners and patients with a complete approach to care that is well-coordinated.

Project Scope / Business Requirement

- Automated process for Integration of Hospice census data from Homecare Homebase (HCHB) and Legacy systems
- Automated process for integration of SNF data from APRIMA and Legacy systems
- Data Extraction from Payroll Systems (SSIS Package)
- Data Extraction from Microsoft GreatPlains (SSIS Package)
- SSIS packages for loading of Pharmacy, Budget, Revenue and Payroll data.
- SSRS reporting from consolidated data of Hospice, payroll, finance and SNF (Medical Groups)
- Analytical reporting in Tableau
- Report distribution using SQL- RD

Challenges

- Understand Business logic and start working on report development in a short period of time
- Understand user applications HCHB and Aprima in short period of time
- Report Generation from multiple heterogeneous Data Sources
- Implement Security features at user level
- Customized report deliver of SSRS reports (SQL-RD implemented for this requirement)

Tools & Technology

- SQL Server 2012 (SSRS and SSIS)
- Tableau 8.1
- SQL – RD

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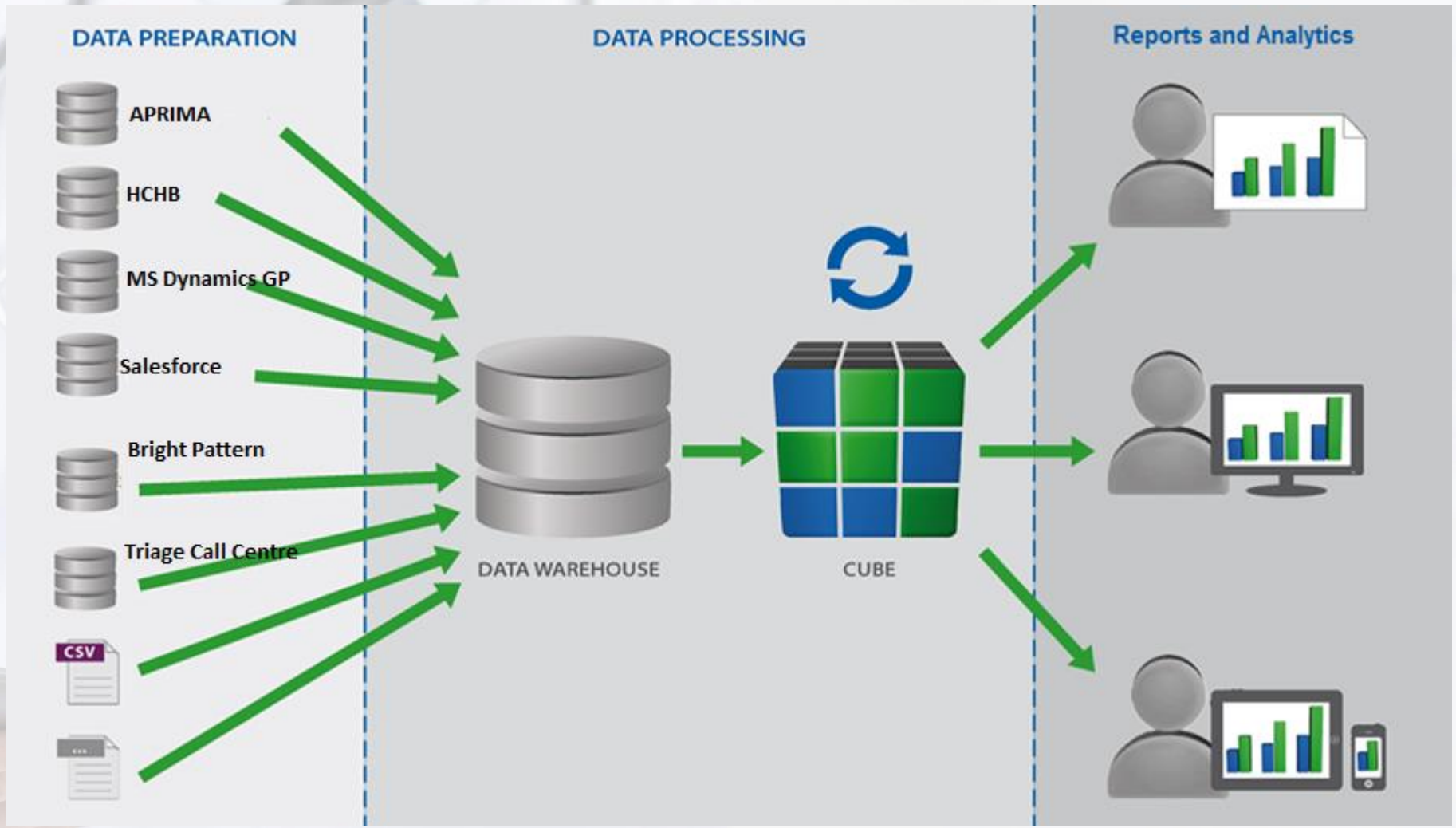
Data Warehouse @ Health Essentials



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Case Study - Sanare

About Sanare

Sanare is an innovative healthcare products and services company with a comprehensive, patient-centric approach to diabetes management. Revolutionary in scope, Sanare's mission is to empower patients toward self-management, help providers improve quality of care, and assist payers and provider networks in reducing the cost of diabetes management.

Project Scope / Business requirement

- Sanare needed an Automated and Integrated solution for upload of daily Data in data warehouse and generation & distribution of various critical business reports based on DWH within specific time.
- Development of automated work flow design for Data upload and report delivery in SQL Server Integration service 2008 R2
- Report Distribution should be in encrypted form
- Report development in SQL Server Reporting 2008 R2.
- On Demand and Scheduled distribution of reports in various formats (Word, Excel , PDF etc.)
- Generation of 75+ reports in following business areas

1. Production Reports
2. Financial Reports
3. Delivery Reports
4. Renewal Reports
5. Sales Reports
6. Patient Status and Demographics reports
7. Compliance Reports
8. Physician Reports
9. Payer (Insurance) Reports
10. Audit Reports
11. User Activities Reports
12. CMN Reports

Challenges

- Understand Business logic and start working on report development in a short period of time
- Report Generation from multiple heterogeneous Data Sources (DWH, NetSuite and other production Databases)
- Implement Security features at user level
- Delivery of password protected reports from report server
- Migration of data from legacy system to Brightree (Cloud Application)

Tools & Technology

- SQL Server 2008 R2 (SSRS and SSIS)

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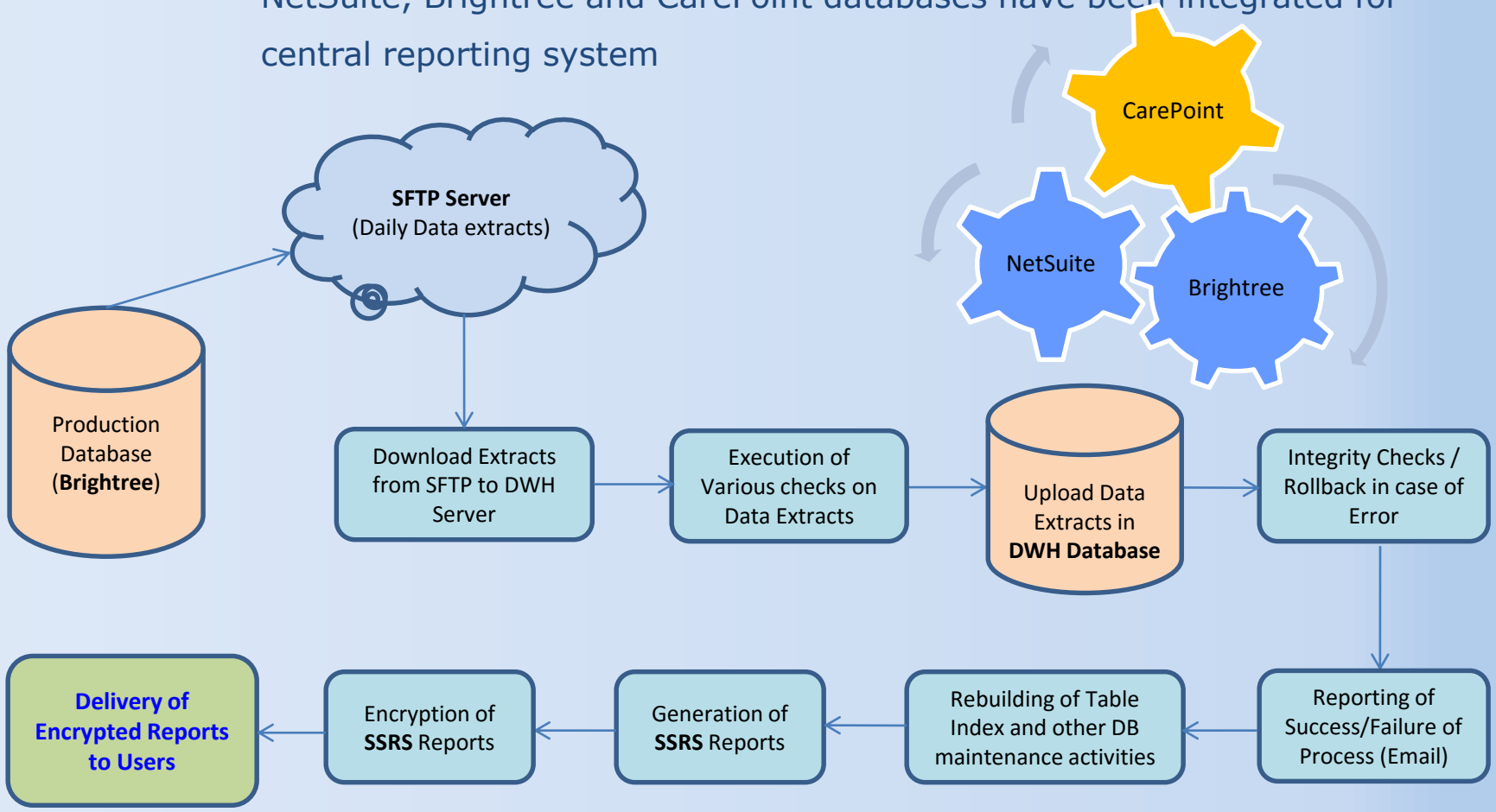
Case Study - Sanare

Solution Offered : Automated process for daily data load and SSRS Reports Delivery, has been created using Reporting and Integration services (SSRS and SSIS). NetSuite, Brightree and CarePoint databases have been integrated for central reporting system



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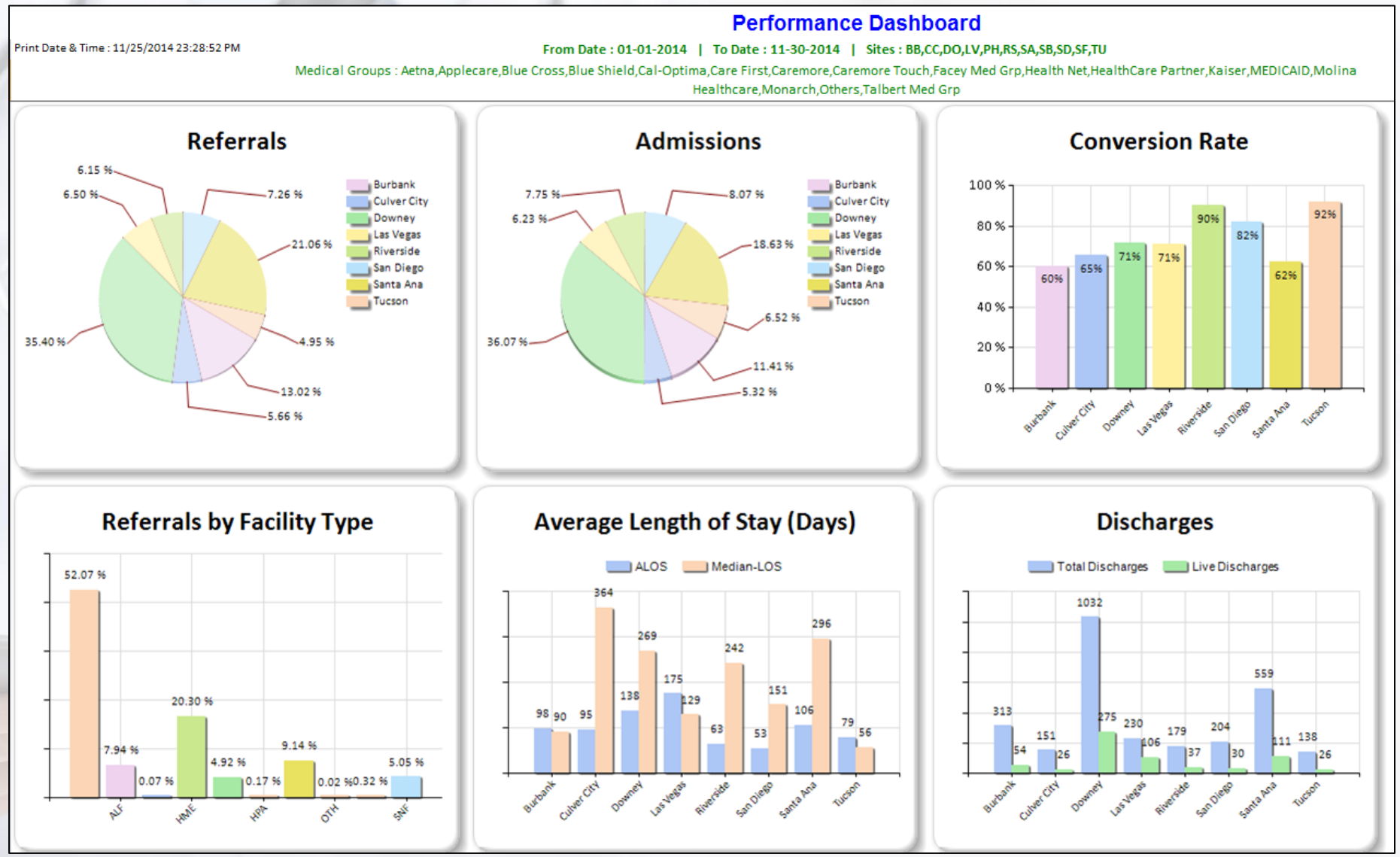
Sample SSRS Reports

Performance dashboard represents the value of various business KPIs in graphical format



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Sample SSRS Reports

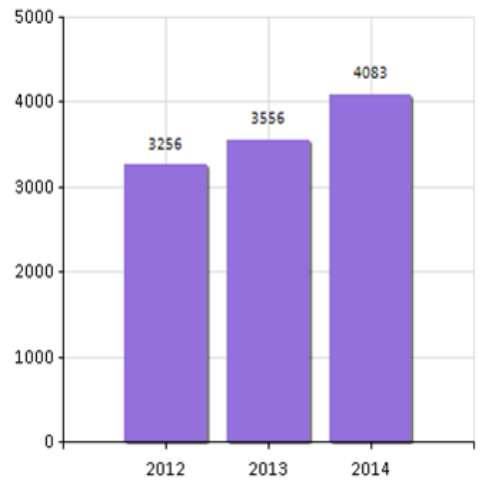
Performance Dashboard

Print Date & Time : 11/25/2014 23:28:52 PM

From Date : 01-01-2014 | To Date : 11-30-2014 | Sites : BB,CC,DO,LV,PH,RS,SA,SB,SD,SF,TU

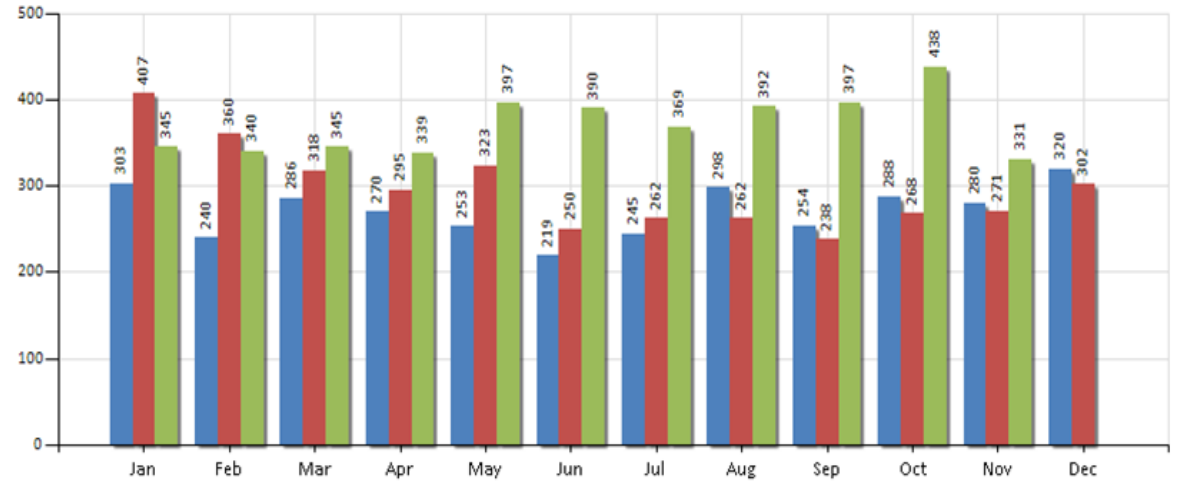
Medical Groups : Aetna,Applecare,Blue Cross,Blue Shield,Cal-Optima,Care First,Caremore,Caremore Touch,Facey Med Grp,Health Net,HealthCare Partner,Kaiser,MEDICAID,Molina Healthcare,Monarch,Others,Talbert Med Grp

Referrals (By Year)



	2012	2013	2014
Number of Referrals :	3256	3556	4083

Referrals (By Month)



Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2012	303	240	286	270	253	219	245	298	254	288	280	320	3256
2013	407	360	318	295	323	250	262	262	238	268	271	302	3556
2014	345	340	345	339	397	390	369	392	397	438	331		4083

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Sample SSRS Report

Revenue BvA report gives the comparison of revenue earned with budget for a given month, spread over the months passed

Revenue (BvA) Report - 2014

Print Date & Time : 11/26/2014 02:11:58

Revenue by LOB and Location	JAN			FEB			MAR			APR			MAY			JU	
	Actual	Budget	Variance	Actual	Budget	Variance	Actual	Budget	Variance	Actual	Budget	Variance	Actual	Budget	Variance	Actual	B
Hospice																	
Burbank	7,10,210	7,15,979	(5,770)	5,83,238	6,57,180	(73,942)	6,45,172	7,43,635	(98,463)	6,20,026	7,35,726	(1,15,700)	6,29,493	7,76,653	(1,47,160)	5,93,774	7,
Culver City	3,07,611	3,11,370	(3,759)	2,54,540	2,81,355	(26,815)	3,19,074	3,27,889	(8,814)	2,57,711	3,17,353	(59,642)	2,61,800	3,27,889	(66,089)	2,48,901	3,
Downey	21,68,353	23,20,887	(1,52,534)	20,65,810	21,13,098	(47,287)	23,11,410	23,59,559	(48,150)	23,68,317	23,10,733	57,584	24,25,165	24,14,827	10,338	18,17,739	23,
Las Vegas	5,66,842	5,46,405	20,437	5,20,017	4,93,526	26,491	5,35,183	5,51,815	(16,632)	3,94,155	5,39,253	(1,45,098)	3,60,739	5,51,815	(1,91,076)	(6,96,413)	5,
Riverside	2,38,274	1,72,533	65,741	2,39,495	1,64,642	74,852	3,01,581	1,87,319	1,14,262	3,40,289	1,91,364	1,48,925	3,14,808	2,13,392	1,01,416	2,94,247	2,
San Diego	2,17,925	1,91,702	26,222	2,00,002	1,87,874	12,128	2,41,493	2,24,608	16,885	2,45,721	2,33,952	11,769	2,50,591	2,52,891	(2,300)	2,45,004	2,
Santa Ana	11,38,604	13,63,588	(2,24,984)	10,29,553	12,38,146	(2,08,594)	11,81,512	14,16,268	(2,34,756)	10,17,695	13,94,390	(3,76,695)	9,39,143	14,51,501	(5,12,358)	8,65,812	14,
Tucson	1,32,283	1,78,261	(45,977)	1,43,183	1,73,243	(30,060)	1,90,197	2,00,603	(10,406)	2,14,418	2,07,023	7,395	2,34,088	2,22,831	11,257	2,48,986	2,
Total	**54,80,103**	**58,00,727**	**(3,20,624)**	**50,35,838**	**53,09,064**	**(2,73,227)**	**57,25,622**	**60,11,696**	**(2,86,074)**	**54,58,332**	**59,29,795**	**(4,71,463)**	**54,15,828**	**62,11,799**	**(7,95,971)**	**36,18,050**	**60,**
Fee For Service																	
California	5,25,706	6,33,965	(1,08,259)	5,16,798	6,47,694	(1,30,896)	5,44,404	6,14,562	(70,158)	5,42,593	5,77,321	(34,729)	4,71,134	5,70,086	(98,952)	4,68,516	5,
Nevada	1,06,530	1,44,692	(38,162)	2,14,940	1,35,202	79,739	2,63,327	1,52,574	1,10,752	1,69,865	1,40,996	28,869	1,59,159	1,50,229	8,930	97,155	1,
Total	**6,32,236**	**7,78,658**	**(1,46,421)**	**7,31,739**	**7,82,896**	**(51,157)**	**8,07,730**	**7,67,136**	**40,594**	**7,12,458**	**7,18,317**	**(5,859)**	**6,30,293**	**7,20,316**	**(90,022)**	**5,65,671**	**6,**
Managed Care																	
CA_Palliative	0	5,000	(5,000)	0	15,000	(15,000)	0	25,000	(25,000)	0	35,000	(35,000)	60,000	42,000	18,000	60,000	
Los Angeles County	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Orange County	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
San Diego County	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	**0**	**5,000**	**(5,000)**	**0**	**15,000**	**(15,000)**	**0**	**25,000**	**(25,000)**	**0**	**35,000**	**(35,000)**	**60,000**	**42,000**	**18,000**	**60,000**	
Pharmacy																	
CRX	2,86,239	3,08,352	(22,113)	2,53,641	2,80,108	(26,466)	2,82,294	3,15,209	(32,915)	2,77,622	3,07,390	(29,768)	3,06,597	3,21,697	(15,100)	3,12,189	3,
Total	**2,86,239**	**3,08,352**	**(22,113)**	**2,53,641**	**2,80,108**	**(26,466)**	**2,82,294**	**3,15,209**	**(32,915)**	**2,77,622**	**3,07,390**	**(29,768)**	**3,06,597**	**3,21,697**	**(15,100)**	**3,12,189**	**3,**
DME																	
RXE	2,43,636	2,31,950	11,686	1,96,945	2,11,014	(14,068)	2,22,626	2,38,218	(15,592)	2,29,672	2,33,716	(4,044)	2,21,244	2,44,850	(23,606)	2,12,019	2,
Total	**2,43,636**	**2,31,950**	**11,686**	**1,96,945**	**2,11,014**	**(14,068)**	**2,22,626**	**2,38,218**	**(15,592)**	**2,29,672**	**2,33,716**	**(4,044)**	**2,21,244**	**2,44,850**	**(23,606)**	**2,12,019**	**2,**

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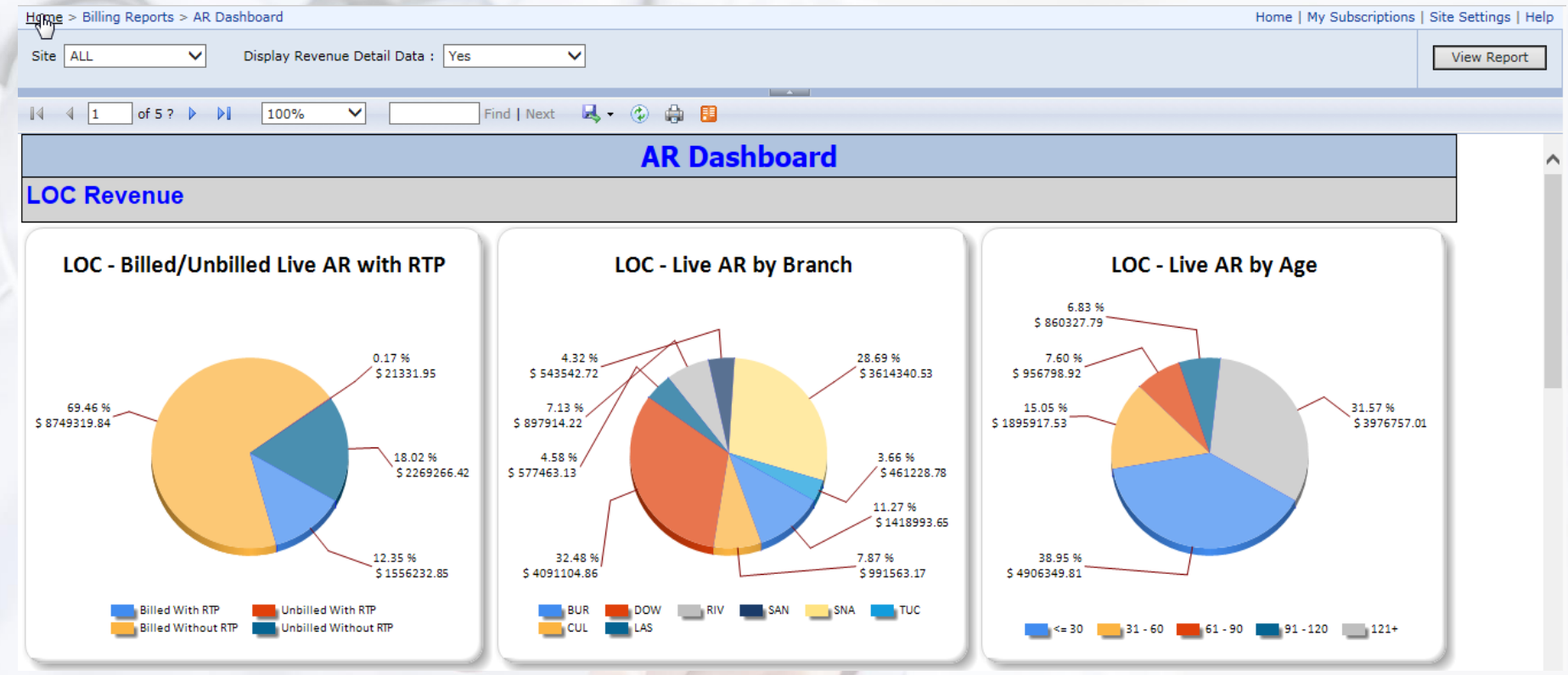
Sample SSRS Report



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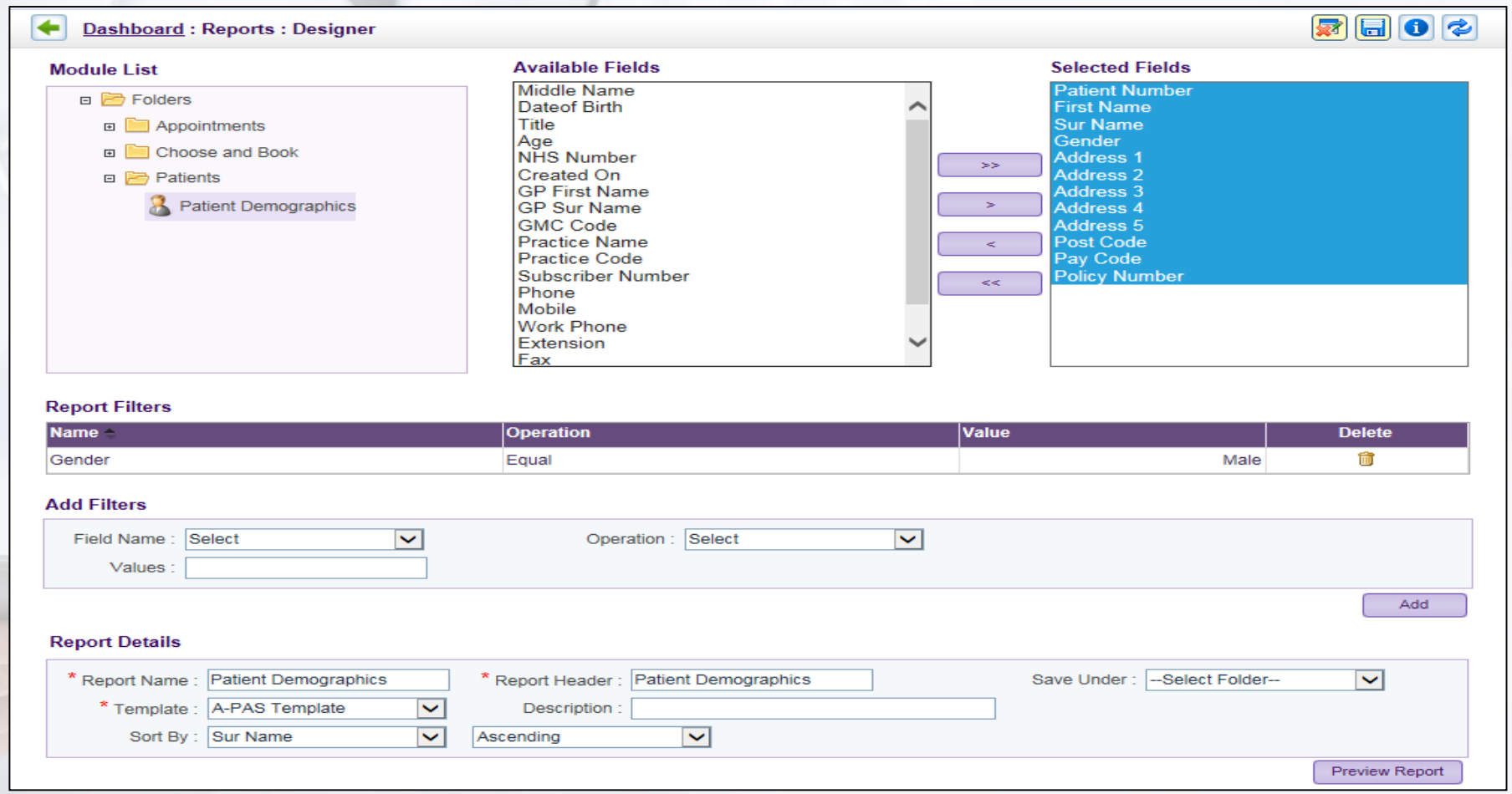
Sample SSRS Reports

For one of our healthcare industry client we have developed .NET application, application gives the facility of dynamic selection of report columns to end user, as per their changing business requirements.



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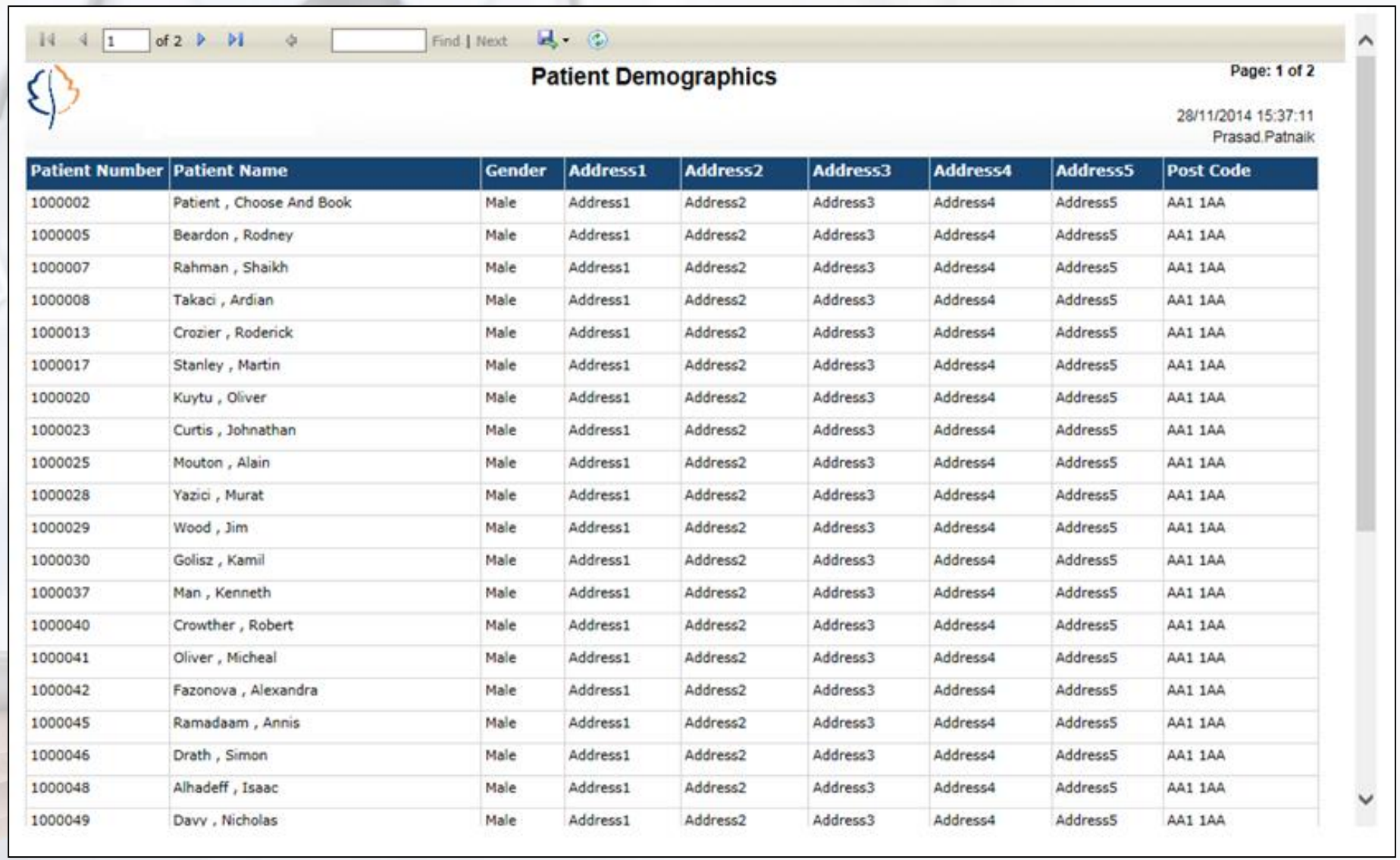
Sample SSRS Reports



Patient Number	Patient Name	Gender	Address1	Address2	Address3	Address4	Address5	Post Code
1000002	Patient , Choose And Book	Male	Address1	Address2	Address3	Address4	Address5	AA1 1AA
1000005	Beardon , Rodney	Male	Address1	Address2	Address3	Address4	Address5	AA1 1AA
1000007	Rahman , Shaikh	Male	Address1	Address2	Address3	Address4	Address5	AA1 1AA
1000008	Takaci , Ardian	Male	Address1	Address2	Address3	Address4	Address5	AA1 1AA
1000013	Crozier , Roderick	Male	Address1	Address2	Address3	Address4	Address5	AA1 1AA
1000017	Stanley , Martin	Male	Address1	Address2	Address3	Address4	Address5	AA1 1AA
1000020	Kuytu , Oliver	Male	Address1	Address2	Address3	Address4	Address5	AA1 1AA
1000023	Curtis , Johnathan	Male	Address1	Address2	Address3	Address4	Address5	AA1 1AA
1000025	Mouton , Alain	Male	Address1	Address2	Address3	Address4	Address5	AA1 1AA
1000028	Yazici , Murat	Male	Address1	Address2	Address3	Address4	Address5	AA1 1AA
1000029	Wood , Jim	Male	Address1	Address2	Address3	Address4	Address5	AA1 1AA
1000030	Golisz , Kamil	Male	Address1	Address2	Address3	Address4	Address5	AA1 1AA
1000037	Man , Kenneth	Male	Address1	Address2	Address3	Address4	Address5	AA1 1AA
1000040	Crowther , Robert	Male	Address1	Address2	Address3	Address4	Address5	AA1 1AA
1000041	Oliver , Micheal	Male	Address1	Address2	Address3	Address4	Address5	AA1 1AA
1000042	Fazonova , Alexandra	Male	Address1	Address2	Address3	Address4	Address5	AA1 1AA
1000045	Ramadaam , Annis	Male	Address1	Address2	Address3	Address4	Address5	AA1 1AA
1000046	Drath , Simon	Male	Address1	Address2	Address3	Address4	Address5	AA1 1AA
1000048	Alhadeff , Isaac	Male	Address1	Address2	Address3	Address4	Address5	AA1 1AA
1000049	Davy , Nicholas	Male	Address1	Address2	Address3	Address4	Address5	AA1 1AA

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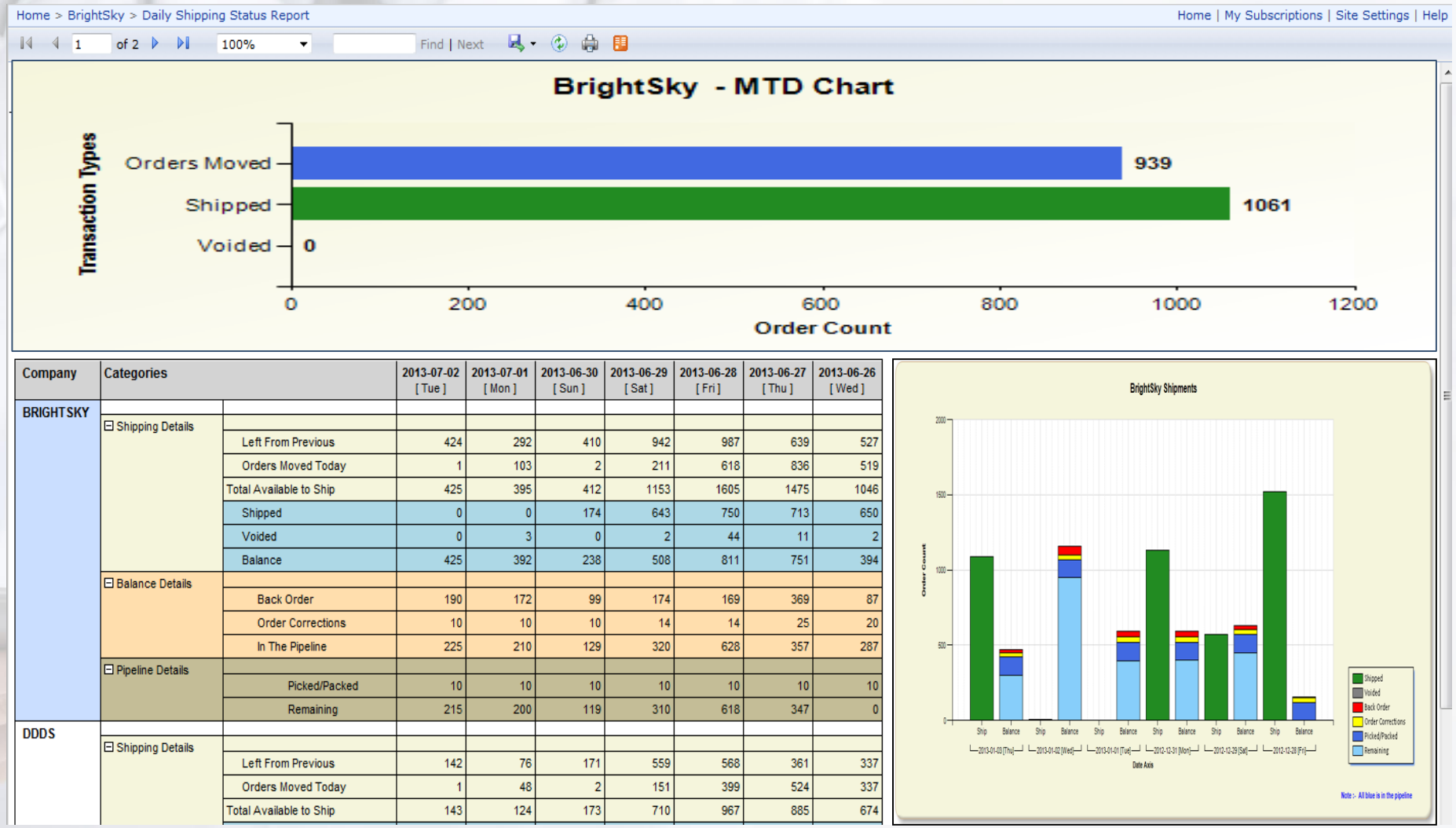
Sample SSRS Report

Shipping status report provides the count of orders staying at various stages, data shown or last seven days with graphical representation.



Company	Categories		2013-07-02 [Tue]	2013-07-01 [Mon]	2013-06-30 [Sun]	2013-06-29 [Sat]	2013-06-28 [Fri]	2013-06-27 [Thu]	2013-06-26 [Wed]
BRIGHTSKY									
	⊟ Shipping Details								
		Left From Previous	424	292	410	942	987	639	527
		Orders Moved Today	1	103	2	211	618	836	519
		Total Available to Ship	425	395	412	1153	1605	1475	1046
		Shipped	0	0	174	643	750	713	650
		Voided	0	3	0	2	44	11	2
		Balance	425	392	238	508	811	751	394
	⊟ Balance Details								
		Back Order	190	172	99	174	169	369	87
		Order Corrections	10	10	10	14	14	25	20
		In The Pipeline	225	210	129	320	628	357	287
	⊟ Pipeline Details								
		Picked/Packed	10	10	10	10	10	10	10
		Remaining	215	200	119	310	618	347	0
DDDS									
	⊟ Shipping Details								
		Left From Previous	142	76	171	559	568	361	337
		Orders Moved Today	1	48	2	151	399	524	337
		Total Available to Ship	143	124	173	710	967	885	674

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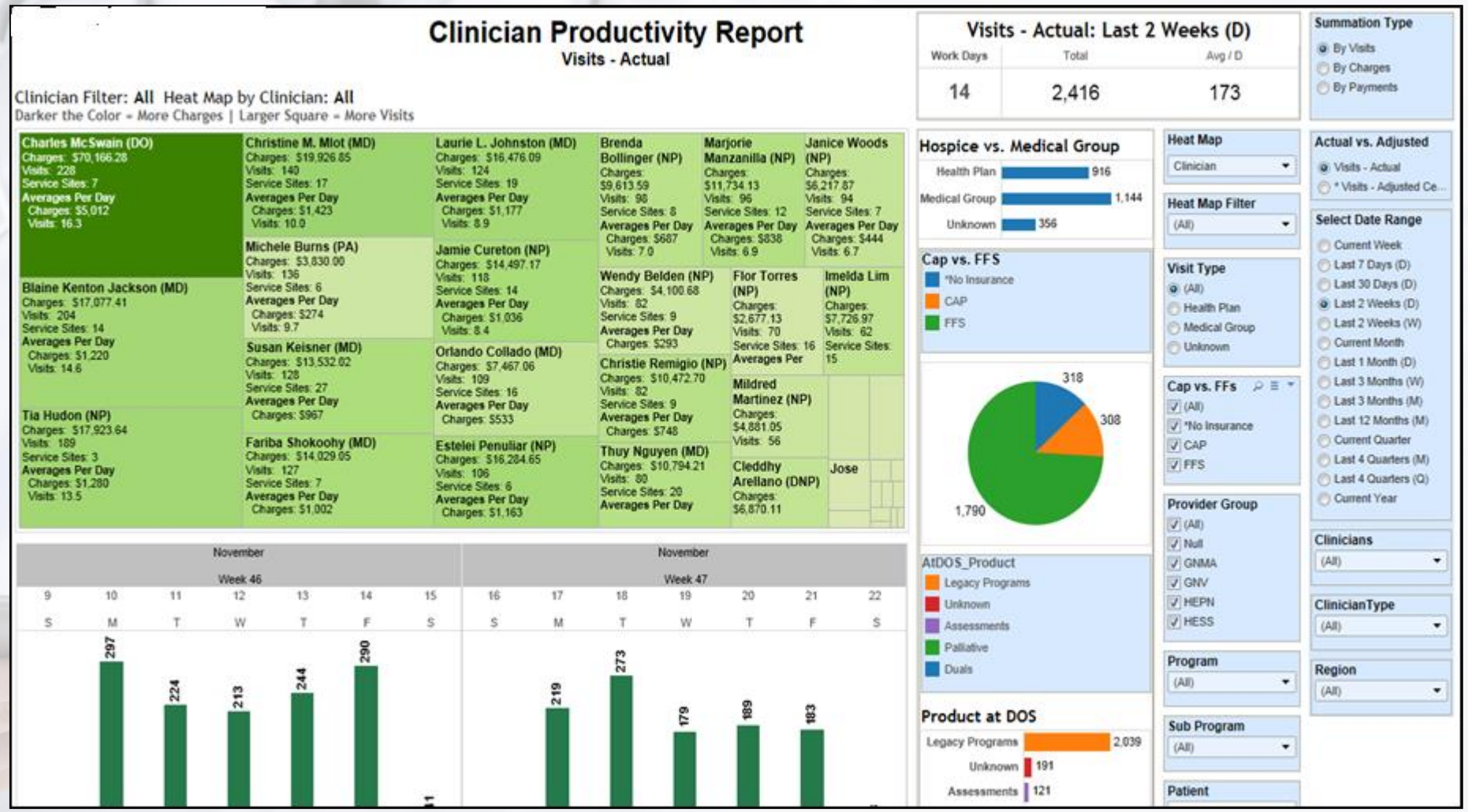
Sample Tableau Report

Clinician productivity report developed in Tableau. This report gives the insight of productivity of various referral providers with multiple breakups and comparisons.



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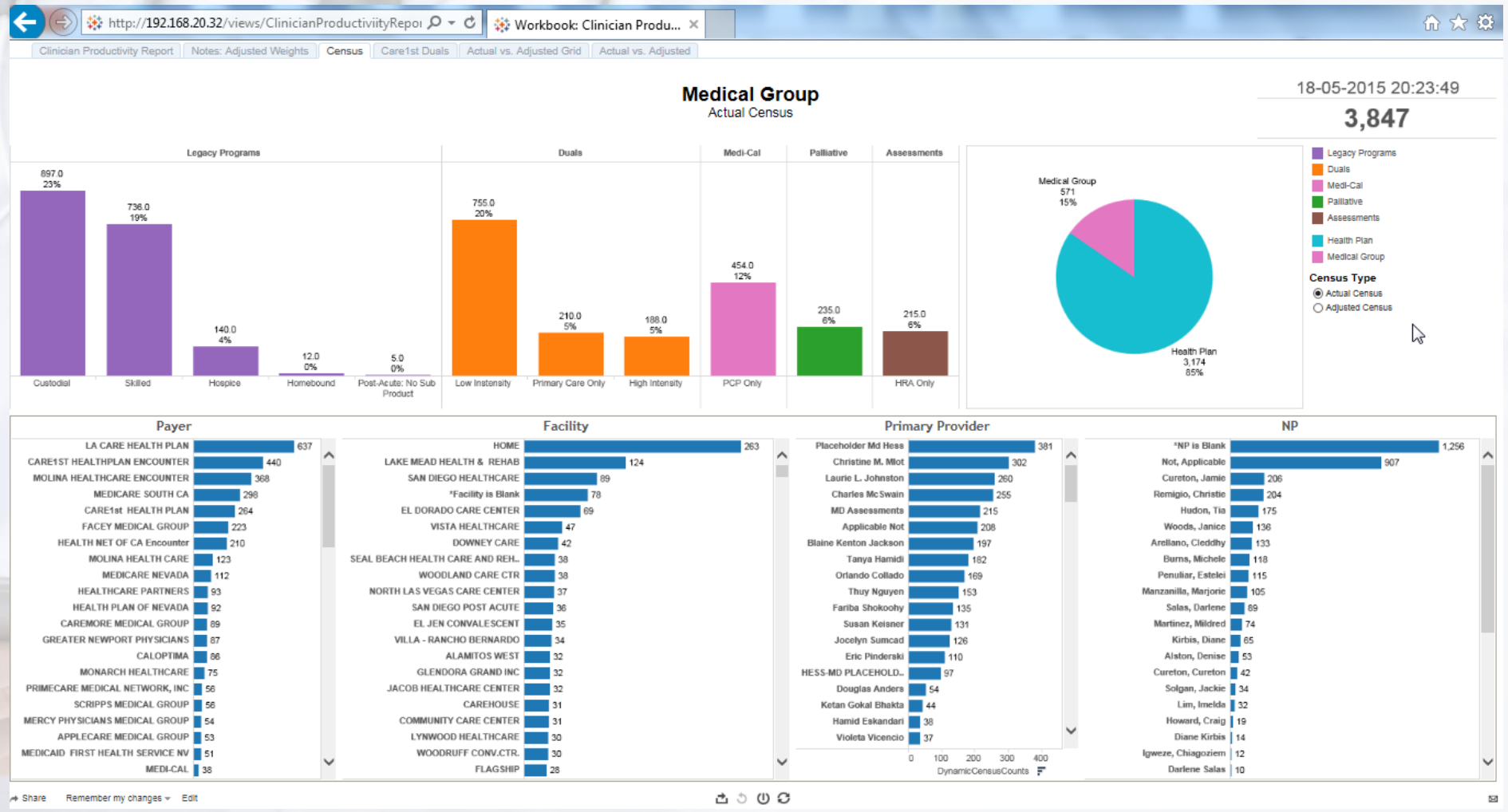
Actual Census Report

Actual census report developed in Tableau. It gives the actual census at any time across the locations, you can further slice and dice the census information by Regions, provider, payer, Facilities and Programs



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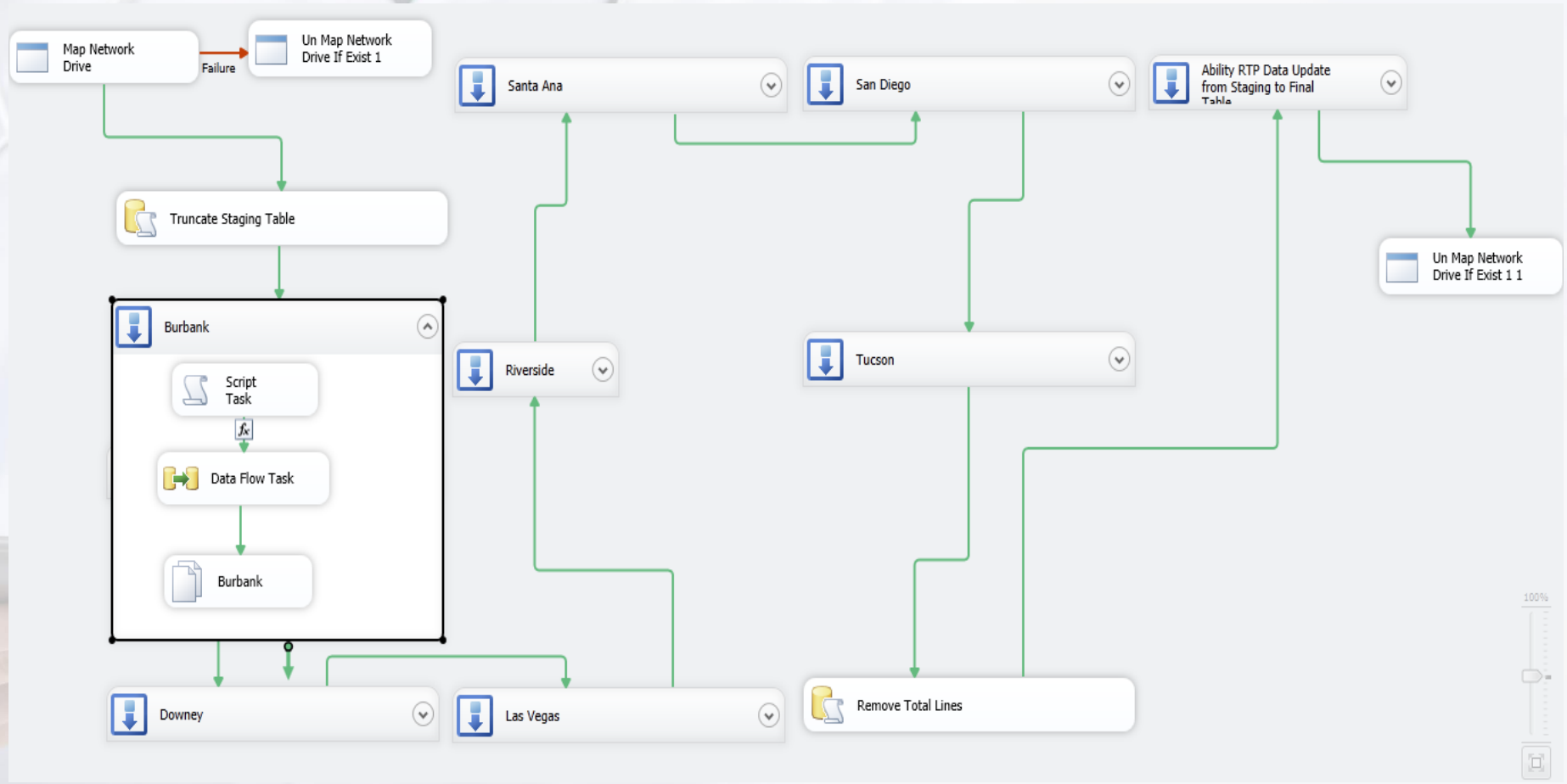
Sample SSIS Package

This is Sample SSIS package developed for loading RTP (Return to Provider) data. Similar packages are developed for loading budget, pharmacy, finance and time & earning data from various data sources e.g. Databases (SQL, Access, Oracle), Excel files, CSV files, XML files etc.



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