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Association for Financial Professionals®

OCTOBER 27–30, 2013 | LAS VEGAS

ORIGINAL→ESSENTIAL→UNBIASED→INFORMATION

Big Data

Finding Your Firm's Analytics Mojo

Before We Begin

- What brought you to this session today?
- Do you have any experience with big data projects?

Cy J. Azvedo, Hewlett Packard

- **WW Treasury Process & Solution Manager, Hewlett Packard**
  - **Global Financial process and system design manager since 2004**
  - **Joined Hewlett Packard in 2000**
  - **Directed process, project and service delivery for the HP Global Business Services Revenue Cycle team including accounts receivable, invoicing, trade revenue, field inventory, and bank operations**
  - **Responsible for Treasury applications design, implementation, and support across HP global service centers and partner locations**

Peter S. Smith, Citi

- **Director, Corporate Market Management, Treasury and Trade Solutions**
  - **Financial services product manager since 2000**
  - **Joined Citi in 2006**
  - **Responsible for North America market development in Cash Management and Trade Finance**

Goals

1. Define big data and explain why it matters to Treasury
2. Learn from HP about big data in finance
3. Suggest a few guidelines for planning big data projects

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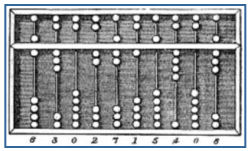
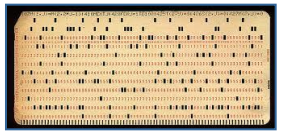
1. What Is Big Data?

A History of Analytics, Briefly

Since the advent of ubiquitous computing the scale of data has transformed, but the more significant shift is in the types of questions we can imagine and answer





Abacus ~ 200BC → **Arithmometer** 1851 → **Burroughs Adding Machine** 1900 → **IBM Punch Cards** 1950 → **Google Glass** 2014

70% of the information in the digital universe is generated by individuals

Unstructured data accounts for 85% of the information

How Big is Big?

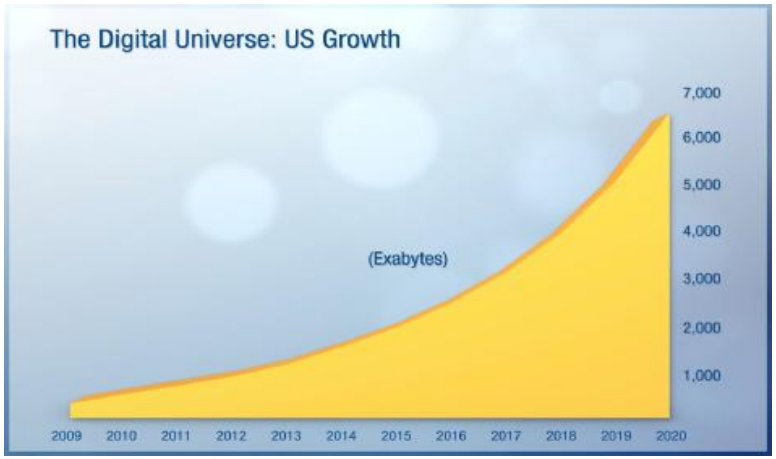
Over 35 Zettabytes of data will be stored globally by 2020…350,000 times more than in 2010

Volume
- 50% of organizations process > 10 TB of data
- 10% process > 1 PB

Velocity
- 30% of organizations process > 100 GB/day

Variety
- Structured data is most common
- Unstructured data is growing fastest
- Widespread in terms of geography and data store
- Spans organizations and structures

Complexity
- Distribution
- Audio and video
- Sentiment and context
- Analytics from search systems



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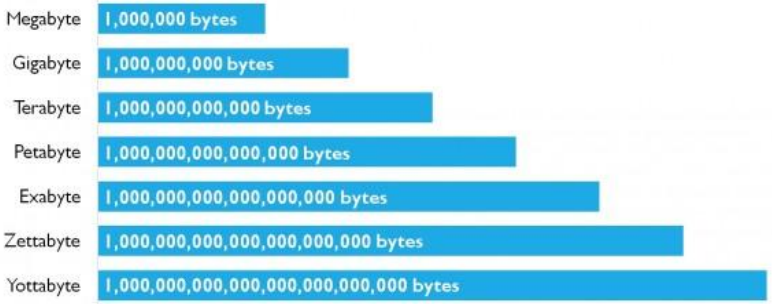

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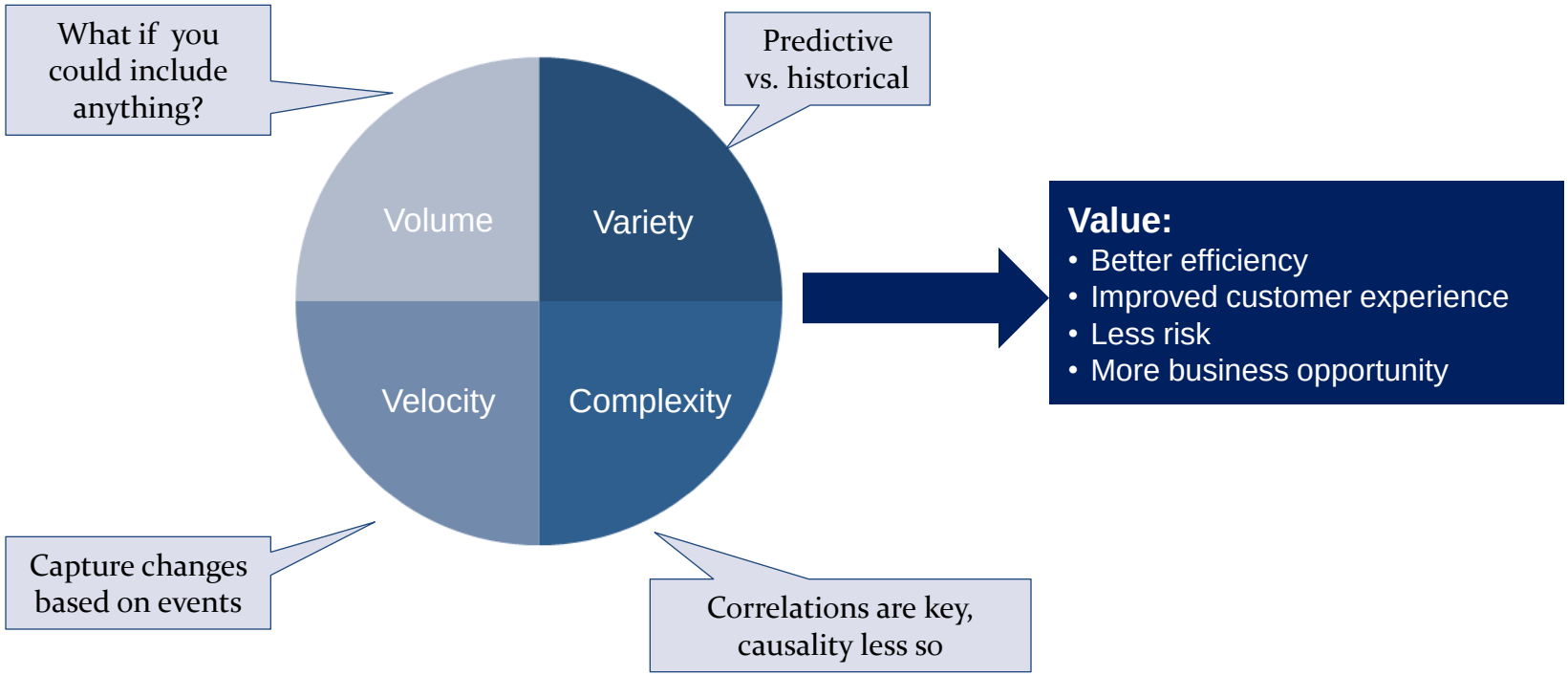
1. IDC: http://www.emc.com/collateral/analyst-reports/idc-digital-universe-united-states.pdf
2. Big Data: http://www.scgroup-llc.com/bannerspace_post/big-data/

Not Just Big

How do you turn size into value?



Big Treasury

Many big data projects have focused on product marketing but the trend remains relevant for Treasury

ERP Systems

SAP ORACLE infor Microsoft sage

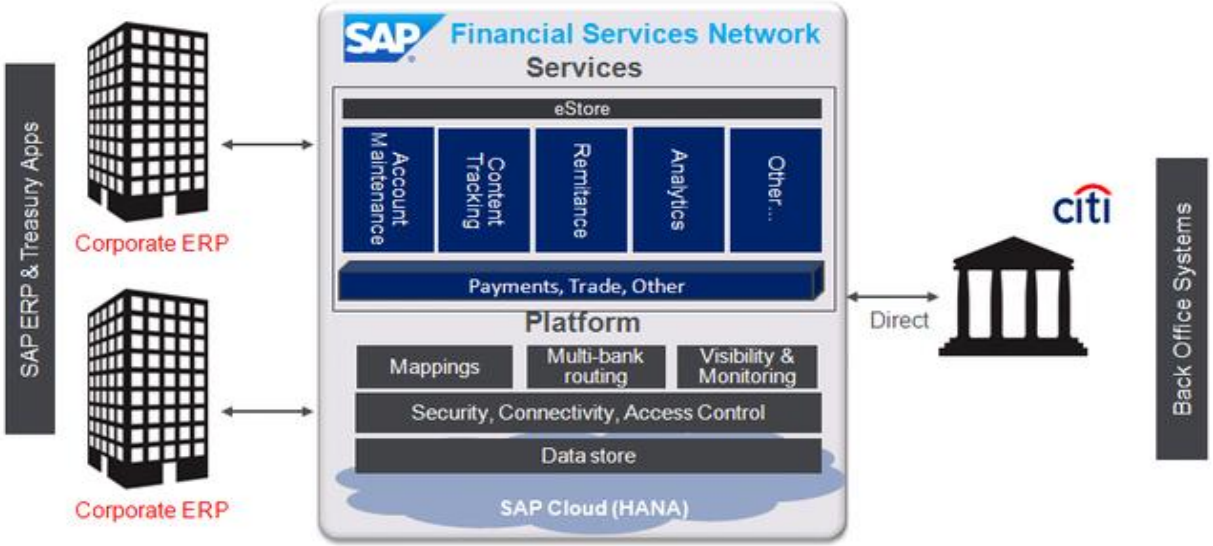
Treasury Workstations

WALLSTREET SYSTEMS REVAL SUNGARD Availability Services kyriba

An ERP or Treasury Workstation is “big,” but isn’t big data, although some convergence has begun

Big Treasury 2

Citi is collaborating with SAP on the creation of the Financial Services Network , a service bureau permitting turnkey integration of banking services with corporate ERPs



- The FSN is based on SAP's private cloud solution (HANA)

Big Treasury 3

Treasury can further increase its strategic value by considering what else could be integrated with financial and cash management data

Examine what is going on outside the firm

–Grasp global trends and impacts from adjacent spaces
–Statistical correlations

Support future decisions

–What impacts critical counterparties
–Trends that alter customer behavior
–Supply Chain effects

Get Granular

–Market Data
–Location Data
–What else matters to your business?

2. Corporate-Led Programs

HP Big Data Experience

Extracting real value from information and extending it across the enterprise is the new currency of business and government.

HP

Enterprise Solutions Information Management and Analytics

Big Data - Technology Drivers

Database Technology	Cloud Computing	Information Integration	Information Consumption
Understand limits of each technology and utilize purpose built databases where needed...	New delivery models, and on-demand scalability have open the doors to new capabilities….	Success comes from the ability to derive meaning and understand how information relates to your business…	Analytics will be consumed by Analyst for decision making, become part of operational workflows, and become embedded in transactional systems…….
In-Database Analytics Compression Columnar Databases Open Source adoption Analytical Database •Vertica •Neteeza •ParAccel Specialty Database •Hadoop •CouchDB •MongoDB	Infrastructure as a Service Software as a Service Platforms and Applications as s Service MPP Platforms Virtual Machines Virtualized Software Larger Disc with improved speed	• ETL and NLP have extended Big data capabilities but have reached their limits • The ability to derive meaning and contextual understanding is key • Human Information is the difference maker and incorporates information from voice and video within the analytics process • Analysis occurs on raw data with integration that is seam-less and near real-time	• Analytics paradigm have shifted to research and predictive analytics and has moved these to the front office • Analysis occurs on raw data with integration that is seam-less and near real-time based on common taxonomies • Enterprise Search and Analytics have merged capabilities • Business will used real-time analytics to drive customers, fraud, pricing, supply chain, and all other operations functions. • The ability to go from raw data to business decisions is now measured in days and hours

Challenge

Harnessing big data: connecting the seen and the unseen

HP

Enterprise Solutions Information Management and Analytics

HP – Finance Big Data Challenges

HP Finance Big Data - Estimated

- 1,000 – FINANCE ENTITIES
- 900M TRANSACTIONS - FINANCE SYSTEMS annually
- 200+ APPLICATIONS WORLDWIDE
- 3.5B LINE ITEMS REPORTED annually

HP Treasury Big Data :

- 3,500 BANK ACCOUNTS
- 375K IN TREASURY TRANSACTIONS every year
- $4+ TRILLION IN VALUE every year

HP Treasury Big Data

Business Case

Counterparty Risk Model & Analytics

It's a risky world…

Global Defaults on Debt were $430B in 2008, up from $8B in 2007

Senior Supervisors Group Survey: Only 9 of top 20 global financial firms manage counterparty risk in line with industry recommendations and best practices

In order to protect the safety of HP's cash, the Treasury department has developed a market factor monitoring methodology to provide an early warning to potential deterioration in a counterparty's credit quality.

What is Counterparty Risk?

Elements of Counterparty Risk Exposure

- Cash
- Bank time deposits
- MTM on derivatives, less collateral
- % of notional on derivatives
- Trade receivables

Main risk categories		Description
Credit risk	Issuer risk	Risk that issuer/borrower defaults and is not able to fulfill the obligation (eg, unable to make full repayments)
	Counterparty risk	Default risk: risk that counterparty defaults and transaction fails to pay; double-default (or wrong-way) risk occurs when collateral is also impaired
		Replacement risk: after a default, risk that replacing deal under same conditions is not possible
		Settlement risk: risk that party involved in the settlement, such as a correspondent bank, fails before transaction has completely settled
Market risk		Risk that value of investment decreases because of change of market prices
Operational risk		Risk of loss resulting from inadequate or failed internal processes, people, and systems or from external events
Liquidity risk		Risk that a given security or asset cannot be traded promptly in the market (eg, to prevent a loss)

[1] Issuer risk for some products, eg, credit default swaps or bonds.

Source: Bank for International Settlements; McKinsey analysis

Investment Policy

Safety

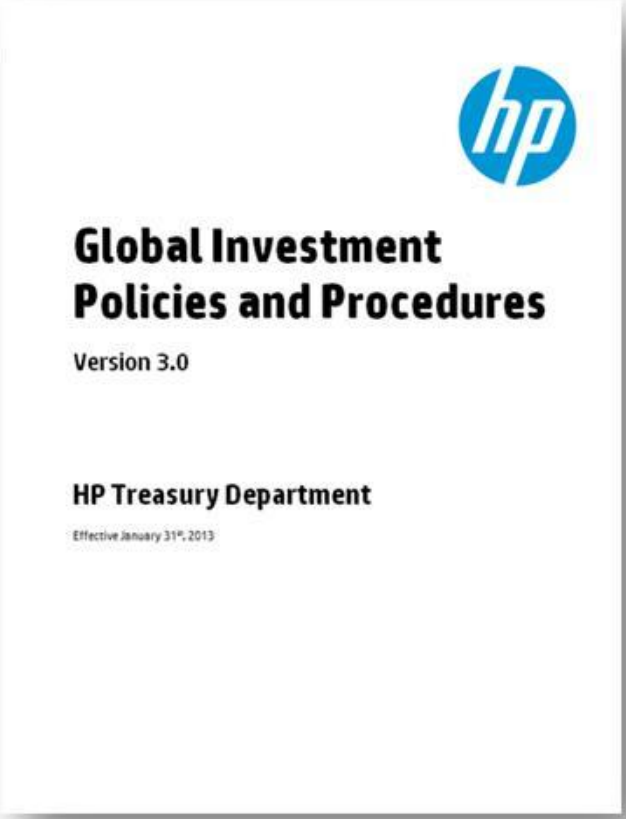
The first and most important goal is safety, defined as the preservation of principal

Liquidity

The next most important goal is liquidity, which is defined by the purchase of highly marketable investments

Yield

After satisfying the safety and liquidity criteria, we seek the highest maximum returns available


Global Investment Policies and Procedures

Version 3.0

HP Treasury Department

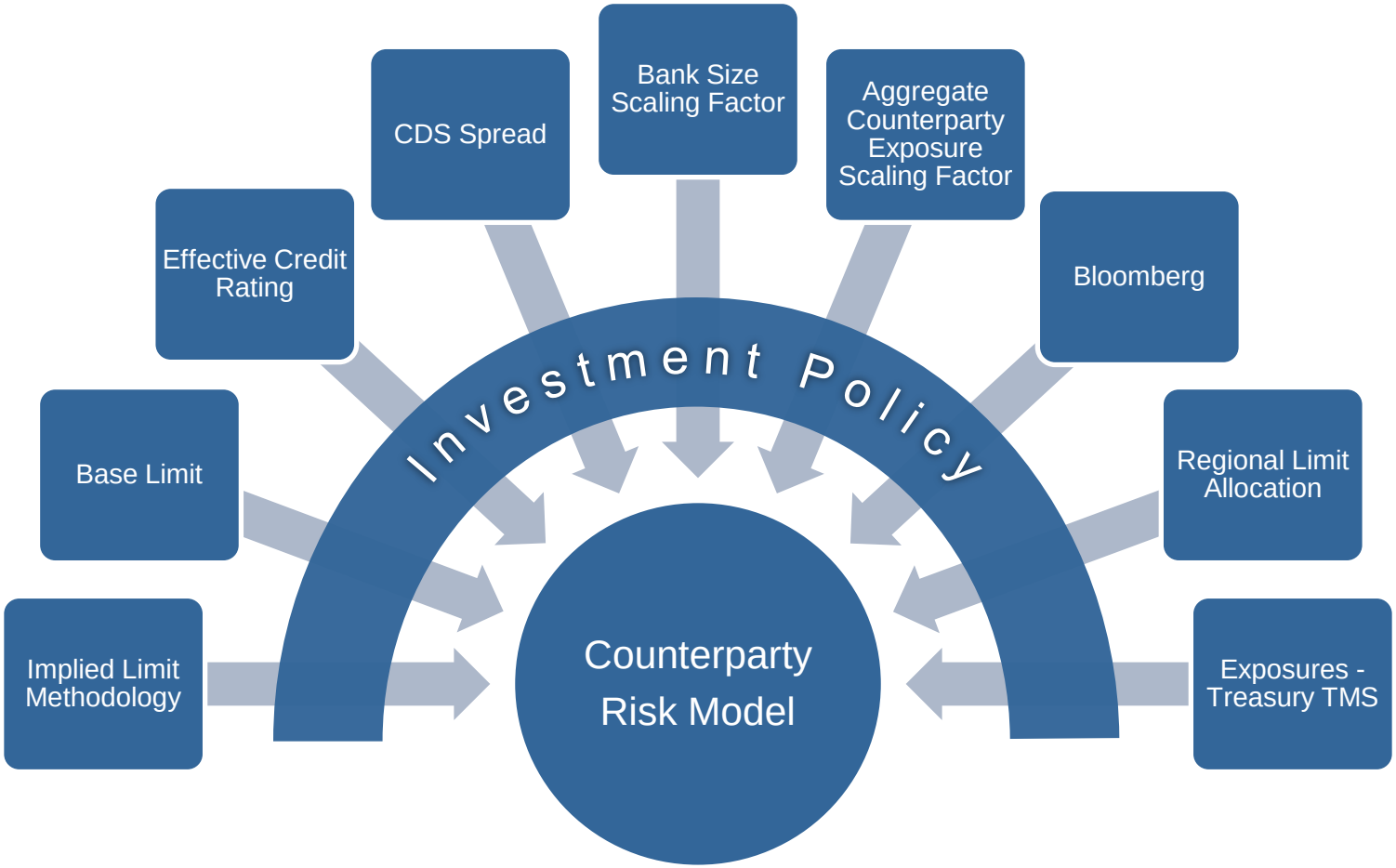
Effective January 31st, 2013

Execution Approach

Four Steps

1. Establish an accurate and timely way to measure counterparty risk
2. Improve the process by which we set and enforce risk limits
3. Align products, structures and processes to reduce risk:
    - Collateralize, where possible: CSA's and Repo
    - Just in Time cash management
    - Accelerate liquidity to IHB via automated pooling
4. Ongoing monitoring & reporting

Counterparty Risk Model – Data Points



Counterparty Risk Model Summary

10 Bank Limits (2013)

Name	Moody's Rating	S&P Rating	Fitch Rating	5 Yr CDS	CASH	FX/IRS MTM	FX/IRS % of Notional	Total Exposure	C&C	Limit in System	Over/Under Exposed
Bank 1	Aa2	AA-	AA-	102	$200	$0	$0	$200	$5	$	$ -
Bank 2	Aa2	AA-	AA-	111	$200	$0	$0	$200	$5	$	$ -
Bank 3	Aa2	AA-	AA-	123	$200	$0	$0	$200	$5	$	$ -
Bank 4	Aa2	AA-	AA-	87	$200	$0	$0	$200	$5	$	$ -
Bank 5	Aa3	A+	AA-	106	$300	$50	$225	$575	$5	$	$ -
Bank 6	Aa3	A+	AA-	103	$300	$50	$225	$575	$5	$	$ -
Bank 7	Aa3	A+	AA-	100	$300	$50	$225	$575	$5	$	$ -
Bank 8	Aa2	AA-	AA	125	$200	$0	$0	$200	$10	$	$ -
Bank 9	Aa2	AA-	AA	79	$200	$0	$0	$200	$10	$	$ -
Bank 10	Aa2	AA-	AA	101	$200	$0	$0	$200	$10	$	$ -
Total					$2,300	$150	$675	$3,125	$65	$	$ -

Counterparty Risk Model Summary

Counterparty Exposure Dashboard

Prompts

Head Office Office

Group Code

☑ CASH ☑ DERIV ☑ EQUIV ☑ FX ☑ LT ☑ ST

Counterparty Exposure

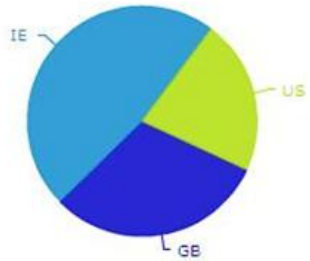
2 Filters

Rows: 5 Cols: 3 Actions

HEAD OFFICE CODE	COUNTRY DOM	COUNTERPARTY DESCRIP	GROUP CODE	PV	LIMIT	Exposure
			CASH	-$103,223.30	$[illegible],000,000.00	-$165,399.85
			FX	-$6,406,424.50	$[illegible],000,000.00	$8,168,310.19
			EQUIV	$938,229	$105,000,000.00	$12,391,585.50
			CASH		$110,000,000.00	-
			DERIV	$[illegible],220.78	$40,000,000.00	$5,650,220.78
Grand Total				$[illegible],802.12	$11,245,000,000.	$26,044,716.62

Example

Exposure by Country



Counterparty Exposure by Group Code

Counterparty Risk Model

Conclusions:

By monitoring counterparty risk the Treasury department can effectively reduce potential losses for the company in the event that any investment held in the portfolio becomes downgraded below minimum acceptable ratings.

Managing this data and translating it into value for the company is the strength of this model.

3. Bank Programs

Uses of Analytics

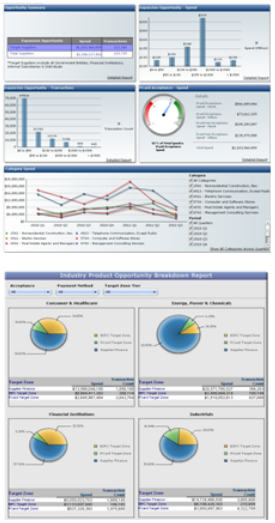
Data analytics tools can help optimize treasury decision-making

1

Diagnose

Recommendations driven by benchmarking and analysis of your payment flows and liquidity structures

Client Analytics



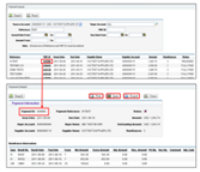
2

Implement

Onboard your supply chain and implement liquidity strategy using automated tools

Payment solutions

Financing solutions



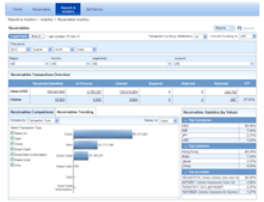
Liquidity solutions

3

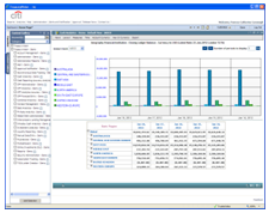
Track

Visibility into program performance and insight for continual improvements

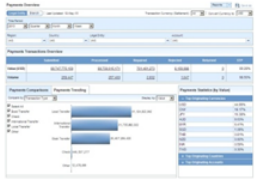
ReceivablesVision℠



TreasuryVision®



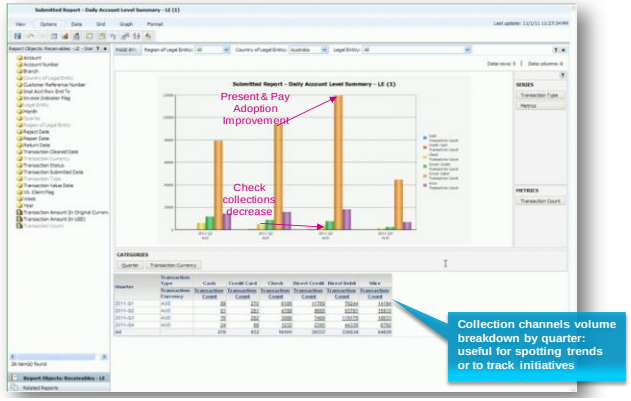
Payment Analytics

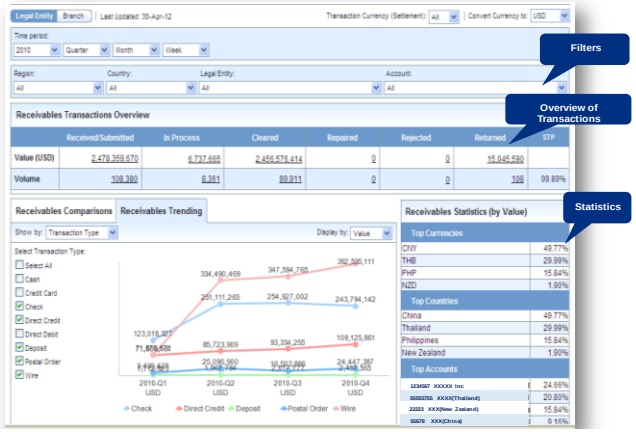


Client Analytics

Cash Collection

Focusing on the many sources of client-level receivables data moves you toward real-time forecasting and better decision-making





Treasurer / CFO

Receivables Dashboard for enterprise wide visibility into recognized revenues and revenue at risk

Finance

Collection reports by
Business Unit
Country
Region
Time period
Intercompany and external funding decisions

Director of Policy

Governance and adoption of electronic payment methods

Account Reconciliation

Export different transactions across varying instruments in a single file

Customer Service / Ops

Investigations
Return Check Report Images

Credit and Risk

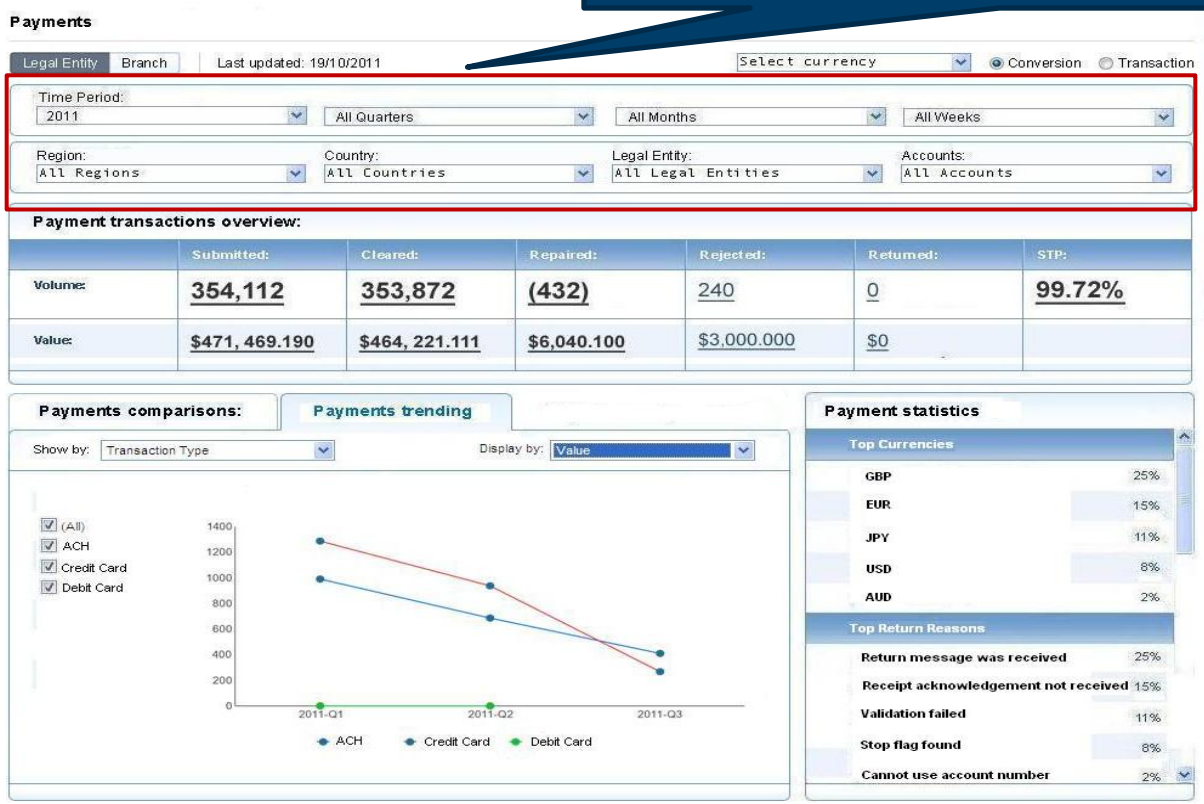
Payer behavior analysis
Top payer analysis
Invoice Dilution Reporting
DSO Delay reasons

Payment Analytics

What is the outlook for our payables? Where to focus?

Analytics Scorecards:

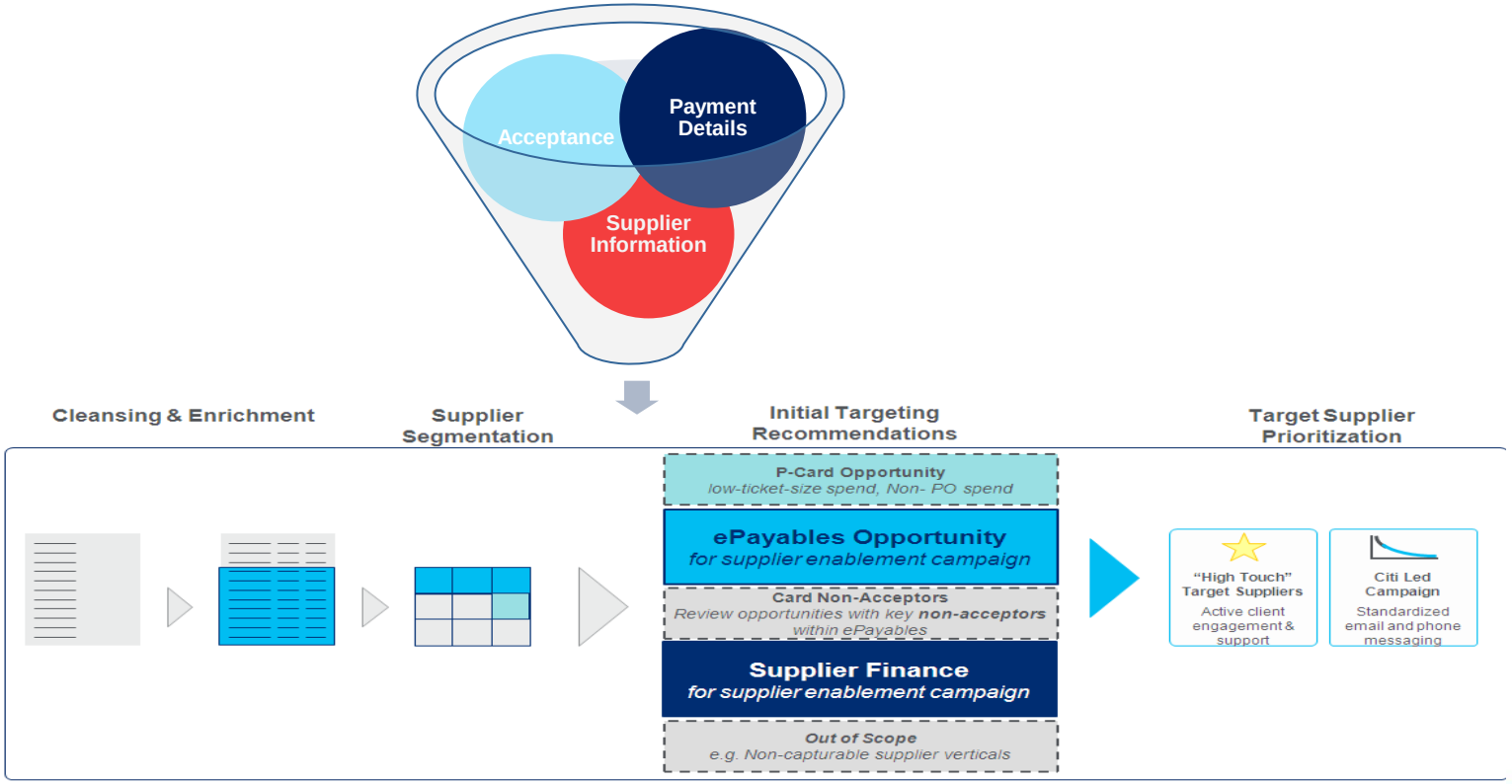
Scorecard Enablers: Local, Regional, Global, Currency, Account level view



- Save reports for future use/access
- Create reports to share

Working Capital Analytics

Proprietary tools to evaluate clients account payable data, identifies areas to optimize working capital, and provides quantifiable recommendations for targeted supplier segmentation



4. Best Practices for Big Data Projects

Roadmap

1. Decide what you want to know
2. Identify the data you will need
3. Pilot and Refine

Questions First

- **Know your problems**
  - Gather them together and distill into questions
    - Are there themes?
    - Is information the solution?
- **Plan for action**
  - Design reports first
  - Insure all questions have an executive owner
    - What is the impact of answer to a question no one has asked?
  - Tie the information to business processes
    - Analytic results should point to concrete next steps
- **Consider the Timing**
  - Real time or periodic?
    - If periodic, how often should this information be updated?
      - Is that update period achievable?
- **Identify Users**
  - Will access be controlled or ad hoc?
  - Who needs what information at what time?

Avoiding Blunders

The larger the organization, the more likely it is that a small team or individual somewhere has bootstrapped a database that is part or all of your solution

- **Planning is key**
  - A “data audit” before you start can spare much heartache
- **You need a strategy to manage the data**
  - Cleansing, de-duplication, and enrichment

Source: http://online.wsj.com/article/SB10001424127887324196204578298381588348290.html

Program Types

Incremental steps are usually more effective than great leaps forward if they are part of a long-term plan

- **Aim for tangible results at manageable scale**
  - Building on “proof-of-concept” initiatives can be more successful in the long term
- **Reduce Risk**
  - Start with the “dirty” data
  - Leverage vendors where possible, in-source later
- **Develop internal communities of interest in initial results**
  - Utilize these to grow support and scale efforts

Source: http://online.wsj.com/article/SB10001424127887324196204578298381588348290.html

Thank You!