# 2015 DATA INVESTMENT SYMPOSIUM

UNDERSTANDING CU\*BASE DATA STRUCTURES & TOOLS EXPLORING NEW IDEAS AROUND EXTERNAL DATA WAREHOUSES



# DATA INVESTMENT SYMPOSIUM WHY?

- Data is getting a lot of attention in today's market as one of the building blocks of any good business...buzzwords abound
- Buzzwords are open to interpretation and usually just make people say, "I need to get active about this"
- When they get active, the first thing they need to do is review what they already have, and see what can be maximized as ready for the next step
- Here at CU\*Answers we're wondering what the next step is, and what investments our client-owners want to make, directly or indirectly through the CUSO

Investment: Time, time, and more time... subject mastered, now spend some money

## FOCUS GROUP INPUT ROUND 1: INTRODUCE YOURSELF

- Tell us your name, credit union name, and your position
- Which of these best describes your role:
  Writing the plan to maximize data?
  Encouraging others to maximize data?
  On the front lines, responsible for finding, presenting, and creatively leveraging the data towards action for success?



## Understanding Our Database

## Getting Data Out of CU\*BASE

## Pulling External Data Into CU\*BASE

## **External Data Warehouses**

When you think data, what else is there?

## UNDERSTANDING OUR DATABASE

UNDERSTANDING OUR INTENTIONS AND THE RESULTS OF YOUR TEAM MEMBERS' WORK USING CU\*BASE

## CU\*BASE: RELATING THE NAME TO THE INTENT

The name CU\*BASE came from the idea that our software would always specialize in being the most comprehensive credit union database we could create

Clients have 100% access to the data used to serve members

- It is designed to be the dominant database in a credit union's arsenal of tools and information
  - Using CU\*BASE as content management system for related solutions (online and mobile banking, etc.)
  - Using CU\*BASE platforms like OTB for foreign data
  - Using CU\*BASE to capture metadata about transactions from other networks







## UNDERSTANDING YOUR CU\*BASE DATA

- We call our database CU\*BASE
  - It's also the name of our product and represents our business logic layer
- Our presentation layer is called GOLD
  - There will eventually be an Operator Edition (OE) and Servicer Edition (SE) presentation layer as well
- For each client, we have to create naming routines for where the database lives ("data warehouses")
  - FILExx and FILExxE (where xx is your credit union ID)
  - QUERYxx

Later today we'll talk about other data warehouses and how you might see them

## TIMING IS EVERYTHING FILEXX VS. FILEXXE

One wrinkle in our data management is the way we time-slice data

## **FILExx**

Represents current data and the answers are based on what's happening right now, this month

## FILExxE

Represents a "snapshot" of data, taken at the end of a month

- It can be difficult if you are trying to trend or compare data with any other time-slice in mind
  - Generally CU\*Answers has handled those kinds of data analyses via dashboards and new products like My CU Today
  - You can create time slices by querying the data and storing your own snapshots in your QUERYxx library

POP QUIZ: CAN YOU IDENTIFY WHERE THE DATA LIVES AND THE TIMING FOR THESE OPTIONS?

Q

If you wanted to see maintenance done on March 3, would the following settings work? No

		Hint:	
CUFS File Mainte	nance Report	Current Month File Name	End-of-Month File Name
Report Options	Response	CUFMNT	ECUmmyy
<ul> <li>Month/year to process</li> <li>During March, you</li> </ul>	run the report as of Feb 2015	5	Tip: Find this file name via
		ECU0215	online help (search "commonly")
• What time-slice are	e we looking at? As of EOM 2/2		or MNQURY #2
Can you change the	e ECU0215 file after Februar	y 28, 201 <i>5</i>	5? No

## POP QUIZ: CAN YOU IDENTIFY WHERE THE DATA LIVES AND THE TIMING FOR THESE OPTIONS?

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On March 3, if you want information from 1/31/2015, could you see it with these settings? Yes

General Ledger Trial	Current Month File Name	End-of-Month File Name	
Report Options	Response	GLHIST	EGSmmyy
Period beginning	Jan 15, 2015 🧮 [MMDDYYYY]	OEHIOT	Loominyy
Period ending	Mar 03, 2015 🧾 [MMDDYYYY]		

- Could you see information for 2/28/2015 with these settings? Yes
- If you back-dated a journal entry on March 2<sup>nd</sup>, effective for 2/25/2015, could you see it? Yes
  - Same question, but what if you Queried the EGS0215 file? No

## THERE'S AN EXCEPTION FOR EVERY RULE...BUT FOCUS ON THE RULES

- To be effective data analysts, you have to learn the nuances of the database and how the day-to-day processes use the data
  - Where do they pull data from?
  - Where do they put data after it's changed?
  - What is the result of maintenance on archived or time-sliced presentations of the data?
  - Who controls the data, and where is it?
- You need to be able to match up the tools or screens your team members use with the data that is being input, maintained, or generated

Learning takes time...it takes experiencing how the software is used and what your team members intend to do

# UNDERSTANDING OUR DATABASE

TOOLS YOU ALREADY HAVE

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## CU\*BASE HAS BEEN AGGRESSIVELY DOCUMENTED HAVE YOU AGGRESSIVELY WORKED TO UNDERSTAND IT?

Session 0 CU\*BASE GOLD Edition -

If you can see it, it's in the database and you can access it

	-Search -
record de	faults for fields such as the Dept/apons 2.
leid Description	
ields marked with a	a asterisk (*) below will appear only when updating an existing membership, not when creating a new one pare that your employee ID has <u>Maintenance Tier 2 special security</u> in order to update the fields.
Field Name	Description
Photo ID on file	Check this box to indicate that a scanned photo ID is on Re. SEE ALSO: Photo ID on File indicator.
Reason code	A marketing code used to indicate the reason that the member is enrolling as a member of the credit union. These codes and how they are used are governed by credit union policy. Click the lookup betton the to see a lint of your credit union's configured codes. SEE ALSO: <u>Why use reason codeo</u> ?
User defined fields	Optional marketing codes used for classification (there are two 1-digit fields). (Descriptions for these codes can be configured using the <u>Liser Defined Code Configuration</u> command on menu MNCNFC.)
Statement group (*)	This field is used to assign this member to a statement group, based on how you want statements to be handled. Zero (0) is used for statements which should be printed, archived, and mailed to the momber. Codes 1 through 9 are credit union-defined and control whother statements are printed and returned to the credit union for special handling, or archived only without printing them.
	Click the lookup button 🚨 to choose from a list of your credit union's configured codes.
	These codes are configured using the <u>Configure Statement Mail Groups</u> command on menu MMPRTC.
	<ul> <li>NOTE: If a member has a statement code other than 0, this member will not be able to be enrolled in e-Statements until the code is removed. If the member is enrolled is e- statement, you will not be able to enter a statement code until that member is un-enrolled from e-Statements. To un-enrol a member from e-Statements refer to this screem.</li> </ul>
	<ul> <li>NOTE: Statement group 07 (used for wrong number) does not perform maintenance on the address to mark it as a wrong email address. This maintenance must be performed on the Email Maintenance screen or by checking "Incomect Address" on the previous Membership Maintenance screen.</li> </ul>
Account exec	This optional field is used to record an Employee ID for the credit union staff responsible for overseeing this member's account. This might represent a personal investment counselor, a preferred loan officer, or even a specific MSR that has a special relationship with this member.
Employee Type (*)	An optional information flag. This can be used in conjunction with Employee Security to control an employee's access to the system (e.g., for credit union employees).
	<ul> <li>Codes are configured using the "insider/Employee Type" command on meru MNCNFC.</li> <li>Chick have the discussion on using insider/Employee Type" command on meru MNCNFC.</li> </ul>

#### File Edit Tools Help Update Membership SUZIE Q MEMBER Name Scan + Occument Acce Opened Aug 26, 1985 maging 5SN Solutions 02 Branch # P Other Information Reason code 100 Electronic deposit hold group 83 0 0 0 User defined fields Tran source ID Due diligence monitoring level (0 - 9) Statement group Allow shared branch transactions count exec 色、 nployee type 0 Proxy ballots 123455 Dividend withholding nployee # partment/sponsor # Exclude from domiancy Eorce monthly statement (Reg E override) heck hold status 1 - 电 ertilication of \$5N C 3rd-party opt out ference CU contact opt out HP 🔄 Ho Preference Selected Exempt from CTR eferred contact method other's malden name TESTING Code word CODESAWAY Marital status Harried Sample@isp.com nail address Email address is wrong Overdraft Service for ATM & Everyday Debit Card Transactions pt in/out: 📝 IN - Member wants the CU to authorize & pay overdrafts on ATM & everyday debit card transactions UUT - Member does NOT want the CU to authorize & pay overdrafts on ATM & everyday debit card transactions rified Feb 17, 2015 By ;D DRWN MOORE Alternate Address Greeting **Reg E Settings** When you use the software, you are urrounded by database tips all day long

## A TOOL FOR THE DATA ANALYST SEARCHING THE DATABASE IN ITS RAW FORM

Instead of looking at CU\*BASE

	screens to see what data is stored						File Field	File description		Commonly Used Files
	in the database, you can also								Description	EOM Filename
search the database directly						File/Table ACCTLST ACCTSM ACCTSM ACCTSTS ACHODA ACHODAN ACHODAN ACHODINT ACHEXP ACHEXP ACHEXP ACHEXT ACHEST1 ACHEST2	NEMBER SELECTED ACCOUNT STATUS ACCOUNT TYPE CD ACH ADENDA DATA PROCESS VERIFIC ACH - CONTROL F ACH - CONTROL F ACH - CONTROL F ACH - RETURN/HO ACH - RETURN/HO ACH INPUT FILE CLOSED MEMBER A	HAT A TELLER ACCESSED ) ACCOUNT NICKNAMES CODES - METRO II DOES - METRO II DOES - METRO II I ATION LOG FILE ILE FOR ACH RETURNS/NOCS M MASTER	EAHnnyy1 EAHnnyy2	
ile Edit Too Databas File name AC	se In	quiry		CCOUNTS (SHARES			● View Fields		SE Report Builder 1 MNQURY) #2	<b>*</b> •
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8 Fields	12.010					*+				

Session 1 CU\*BASE GOLD Edition - CU\*ANSWERS TEST CREDIT UNION (CU

Edit Tools

tabase Inquiry

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## REMEMBER THE 80/20 RULE

- Most of the time you're looking for files that fit the 80/20 rule
  - 20% of the files contain data relevant to working with members ... representing 80% of the inquiries you'll ever need to do



		- Search -	r
Home - Report	Builder / IBM Quer	y (MNQURY / MNQRY2) > Commonly Used CU*BASE Files	1
Comm	only Use	d CU*BASE Files	
		Search for Fields and Files	
LLUSTRATIO	V. Libranes, Files	a. Records. and Freids (Oh Myl)	
What a nuick o	veniew of the Da	tabase inquiry feature? Refer to the Database inquiry Tool fiver	
triat a dates a		and a sharp a second of the second	
exhaustive list	of all of the files of	es you will need for setting up custom reports and inquiries on the CU/BASE system. It is not an on the system. If you need access to other files not shown here, try using the <u>Database Inquiry tool</u> CU/BASE representative for assistance.	
Current Files			
These files stor xx)	e information for	the current month. They are located in the following Library (substitute your credit union's ID for the	
Library	FILExx		
End-of-Month P	(brd)		
		in be used to see data as it existed as of end-of-month; for a specific month and year (mmyy). These ing Library (substitute your credit union's ID for the xx)	
Library	FILExxE		
Current Month File Name	End-of-Month File Name	Description	
ACCTNM	(n/B	Account nicknames for all member sub-accounts.	
ACHDST	n/a	ACH distribution information (now includes ACH company name).	
ACHIST1	EAHmmyy1	Main share and sub-share account information for <u>closed</u> accounts, including IRA share accounts. (See also MEMBER1.)	
ACHIST2	EAHmmyy2	Share draft (checking) account information for <u>closed</u> accounts. (See also MEMBER2.)	
ACHIST3	EAHmmyy3	CD account Information for <u>closed</u> accounts, including IRA certificate accounts. (See also MEMBER3.)	
ACHIST4	EAHmmyy4	Tax escrow account information for closed accounts. (See also MEMBER4.)	
ACHIST5	EAHmmyy5	Closed-end loan account information for closed accounts. (See also MEMBER5.)	
ACHIST6	EAHmmyy6	Open line-of-credit loan account information for <u>closed</u> accounts. (See also MEMBER6.)	
ADSL	EADmmyy	Additional signer (co-signer) information for loan accounts.	
AHDET	n/9	Details showing audio response and online banking activity by member. Updated monthly,	
101010	8	SEE ALSO: Online/Text/Mobile/ARU Banking Statistical Deathboard	
AHSUM	n/9	A summary of audio response and online banking activity. Updated monthly, SEE ALSO: Online/Text/Mobile/ARU Banking Statistical Dashboard	

This file contains Alternate Address records.

This file contains Accounts Payable History records.

This file contains Accounts Payable Vendor records This file contains Variable Rate Loan Information records

This file contains Additional Signers information from the loan application process.

This file contains additional signer information (co-signer) for closed loan accounts

ALTADO

ASDA

ADSCL

APHIST

APVEND

ARLVRC

n/a

n/a

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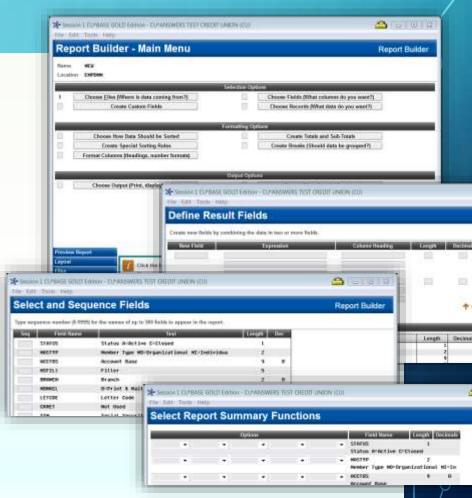
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## CURIOSITY MAKES THE CAT

- If you're not curious about what data means to your organization, none of these tools will help you
- The best way to understand a database is to ask questions of that database
  - The search for answers is the work that teaches you the practical applications for the key data about your credit union



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It's only hard because it's different...but every data analyst had to learn a new tool along the way

#### LEARN THROUGH SMALL WINS HOW MANY COOL REPORTS CAN YOU GENERATE FROM ONE FILE? × • • × Sension 1 CU\*BASE GOLD Edition - CU\*ANSWERS TEST CREDIT UNION (CU) File Edit Tools Help CU\*BASE Report Builder 1 The easiest way to Search for **Wy Menus** CU\*BASE Report Builder **Misc. File Inquiries** 5300 Call Report Tools learn the data is 15 ACHSM - ACH Fed Transmissn Summ 1 Build a Custom Report or Inquiry ACH/Payroll Processing Audit Misc. Configurations 2 Search for Files and Fields AUDICC - ARU Stats Auditing Functions often one file at a 3 Print List of Custom Rpts/Ings AUDICC - Online Banking Stats 17 **Back Office** Check Processing Member/Account File Inquiries 18 AUDILA - ARU Loan App Requests **Check/ATM Processing Collection Processing** 5 MASTER - Membership Records CLML - Collateral/VIN# Lookup 19 time **Configuration Functions TKLRHN - Cross Selling Task** 6 MEMBER1 - Share/IRA Accounts 20 **CU\*BASE Main Menu** CU\*BASE Report Builder 1 7 MEMBER2 - Checking/Draft Accts **IRABL - IRA Bal File Comparison** 21 CU\*BASE has over MEMBER3 - Certificate Accounts MSR/MSA/MSQ - Member Survey My Shortcuts 8 22 Account Maintenance 9 MEMBER5 - Loan Accounts 23 PCMBRCFG - Email Address Lookup Acct Adjustment (Coded) MEMBER5 - Student Loan Ing PCMBRCFG - Mbrs with Email Addrs 10 . 24 40 ready-to-use Acct Adjustment (Full) Add Club Members 11 MEMBER6 - LOC Accounts PLASTIC - ATM/Debit Card Ing 25 ATM Check Digit Calc 12 . TRANS1 - SH/SD Transactions SECAUD - Employee Activity **Calc Number of Days** 26 "canned" queries **Calculate Check Digit** 13 . TRANS2 - LN/LOC Transactions Additional Menus **Change Printer Outgueue Close Memberships/Accts** 14 . **TRANS3 - CD Transactions** 28 \* MNORY2--CU\*BASE Report Builder 2 Collateral - VIN# Lookup 🚔 o 💷 🖾 Session 1 CUPBASE GOLD Edition - CUPANSWERS TEST CREDIT UNION (CU) Collection Processing File Edit Tools Help Menu-option 63 Select Records Report Builder Shortcut Enter criteria to choose which data should appear on the report. Criteria (Field, #, 'Text', etc.) Field Name Compariso Session 1 CU\*BASE GOLD Edition - CU\*ANSWERS TEST CREDIT UNION (CU) S O D X File Edit Tools Help **Display Report** Report Builder Position to line Shift to column Report width Line 12011 3....+.... 14. Field Name Text Ind/ Mar Br flecount First MI Lupt Name Bote Social Address Line #1-Address Line #2 **Opened Security**/ Member Type MD=Organizational MI= firo Desig # Base Name TIN 7/24/14 12 81 866682 RI HI 9/25/00

000003 MI MI

7/01/87

## IT GETS TRICKIER FROM THERE

- Joining files takes experience, and when you have to generate new files to use as the basis for extended queries, it can get even more complex
- Dashboards were designed so CU\*BASE users can easily see the results of complicated queries of the CU\*BASE database
- Dashboards and even reports bring the relevant data together and allow it to be filtered to find information quickly and precisely

	CU*BASE® Leadership Dashboard
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http://www.cuanswers.com/pdf/cb \_ref/Leadership\_Dashboards.pdf

## USE A DASHBOARD TO KICK-START YOUR ANALYSIS 19

Dashboards are ready-made tools with extensive filtering built in

Se	lect Re	ecords				Rep	ort Builder		
Enter	r criteria to c	hoose which data sho	ould appear on the report.						
	nbine rd/Or)	Field Name	Comparison			riteria ∛, "Text", ∎tc.)			
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Account # 🔺 #	# Accts		Name	Date Opened	Date Closed	Gender	Emp ID	Branch	ZIP
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gather the data you are looking for

## USE A DASHBOARD TO KICK-START YOUR ANALYSIS 20

When you identify the data you wish to work with, dashboards can help you with another tricky Query feature

Database File Output	
File name       DAWNLIST       Image: Cubase Q       The name of a new or e         Location       CUBASE Q       The storage location for         Data set       *FILE       OPTIONAL - A set of dat         Data in file       Replace file       •         For a new file, specify:       •       •	Session 0 CU*BASE GOLD Edition - Export
Authority <b>*LIBCRTAUT</b> Text Print definition	Export selection ⊚ A <u>c</u> counts for Member Connect ⊚ <u>A</u> ccount detail for query

Can you teach everyday CU\*BASE users to generate the data they want to analyze and give you a file to start with?

# WHAT IS THE DIFFERENCE BETWEEN HUNTING AND PECKING FOR DATA AND ANALYZING IT?

#### **Account Composition**

An analytical tool to understand what accounts this crowd has with you
Prepares the analyst to talk to the crowd

View commo bonds in: 

Account composition

Membership traits

Credit history trends

Tiered Service analysis

FR (5451)

#### **Membership Traits**

21

 An analytical tool to understand what membership traits has in common
 Prepares the analyst to talk to the crowd

#### **Credit History Trends**

- An analytical tool to better understand the creditworthiness of this crowd
- Prepares the analyst to talk to the crowd

#### **Tiered Service Analysis**

- An analytical tool to show the relationships and penetration you have with this crowd
- Prepares the analyst to talk to the crowd

# WHAT IS THE DIFFERENCE BETWEEN HUNTING AND PECKING FOR DATA AND ANALYZING IT?

#### **Account Composition**

- 10 analysis screens
- 23 tables with answers about membership traits, and 14 graphs
- PDF, Excel and comma-delimited downloads

onde in: 

Account composition

Membership traits

Credit history trends

Tiered Service analysis

View com

#### **Membership Traits**

- **5** analysis screens
- 17 tables with answers about membership traits, and 17 graphs
  PDF, Excel and comma-delimited downloads

### Tiered Service Analysis

22

- 6 analysis screens
- 44 analyzed products and services
- PDF, Excel and commadelimited downloads

Coming in 15.0: You won't even need to use a dashboard – create a file with account bases and look at their common bonds

### Credit History Trends

- Delivers a list of members with credit scores
- 1 analysis screen with 5 tables and additional drill-downs
- PDF, Excel and comma-delimited downloads

## POP QUIZ: HOW MUCH ATTENTION HAVE YOU PAID TO THE CURRENT TOOLS TO UNDERSTAND 23 YOUR DATA?

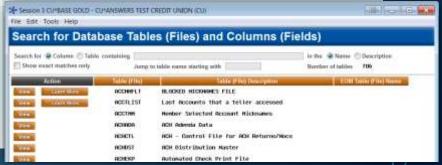
- How much time do data specialists spend with their CU team members to understand where data comes from and how it's used?
- How much time have you spent using the database inquiry to understand what's available from another point of view?
- Off the top of your head, how many of the most commonly-used files can you list and link to 80% of the inquiries you'll ever get?
- Can you do simple single-file queries? Have you mastered the canned queries?
- Do you know why dashboards were created and how they can help you as an analyst?

# UNDERSTANDING OUR DATABASE

NEW TOOLS WE'RE WORKING ON

## IMPROVING THE DATABASE INQUIRY

- A renewed interest in data awareness by credit unions has inspired us to take the database inquiry to a new level
  - New Database Search tool slated for the 15.2 release (October)
  - Comes from the "metadata" (data about data)
- More than just a fancy new screen, the project also includes a significant review of all database files and fields and the information we present about the data (along with what's already in online help)
  - Moving from DDS to DDL



Let's take a look...

Session 3 CU*BASE GOLD - CU*ANS	WERS TEST CRE		
File Edit Tools Help			Coming in the 15.2 release
Search for Databas	e Tables	(Files) and Columns (Fields)	T3.2 release
Search for  Column  Table contai Show exact matches only			Name Description
	Jump to ta	able name starting with Numb	per of tables 706
Action Ta	ible (File)	Table (File) Description	EOM Table (File) Name
View Learn More A	ICCNNFL T	BLOCKED NICKNAMES FILE	
View Learn More A	CCTLIST	Last Accounts that a teller accessed	
View	ICCTNM	Member Selected Account Nicknames	
View	ichada	ACH Adenda Data	
View	CHCTL	ACH - Control File for ACH Returns/Nocs	
View	CHDST	ACH Distribution Master	
View	ICHEKP	Automated Check Print File	
View	ICHFED	ACH - Return/NOC Entry File for Fed Line	
View	CHIN	ACH Manual Input File	
View Learn More A	ICHIST1	Closed Member Accounts (Shares and IRA Shares)	EAHnmyy1
View 🖑 A	CHIST2	Closed Member Accounts (Share Drafts/Checking)	EAHnmyy2
View	ICHIST3	Closed Member Accounts (Certificates)	EAHnnyy3
View	CHIST4	Closed Member Accounts (Tax Escrow)	EAHnmyy4
View	CHIST5	Closed Member Accounts (Loans - Closed End)	EAHnmyy5
A	CHIST6	Closed Member Accounts (Loans - Line of Credit)	ЕАНттууб
View	CHPC	ACH PC File for Magic Writer	
	ichpst	ACH Post File	

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* Session 3 CU*B	ASE GOLD - CU*A	ANSWERS TEST CREDIT UNION (CU)			
File Edit Tools	Help			Coming in	
Columns	(Fields)	in this Database Table (File)		15.2 rele	ease
Table (File) name	ACHIST1 C	Closed Member Accounts (Shares and IRA Shares)		Number of columns	68
Action	Column (Field) N		Туре	Total Length Decimal P	laces
	STATUS	Status C=Closed S=Suspended	CHAR	1	
Learn More	APLTYP	Applic Type SH/IR	CHAR	2	
	ACCTBS	Account Base	NUMERIC	9	0
	ACTTYP	Account Type	NUMERIC	3	0
	ACLSEQ	Closed Seq	NUMERIC	2	0
	CORPID	Corp ID	NUMERIC	2	0
	SAVEN	S=Share L=Loan	CHAR	1	
	BRANCH	Branch	NUMERIC	2	0
	CURBAL	Current Account Balance	NUMERIC	11	2
	GLACTP	G/L Account	NUMERIC	5	2
	LSTTRNDAT	Last Tran Date (CCYYMMDD)	DATE	10	
	OPENDAT	Open Date (CCYYMMDD)	DATE	10	
	LSTMNTDAT	Last Maint Date (CCYYMMDD)	DATE	10	
	CLODAT	Close Date (CCYYMMDD)	DATE	10	
	LETCDE	Letter Code	CHAR	3	
	COLLID	Coll ID	CHAR	2	
Learn More	RSNCDEOPN	Open Reason Code	CHAR	2	
Learn More	RSNCDECLO	Close Reason Code	CHAR	2	
	ANNBKW	YTD Backup Withholding'Total	NUMERIC	9	2

#### BT (5650) 2/17/15

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## SIDEBAR...COMING IN 2016

Say goodbye to "menus" and say hello to a new way to search for CU\*BASE tools

Serving the Google generation: Searching is the new norm



Products

Solutions

Resources

What's cooking in the kitchen?

CU'ANSWERS

We're always coolong up new ideas iere in the CUMAnswers Kitchen and we'd line to share some of our cament recipes with you. These are time of the large topic projects that animumently in varying phases of

Revamping the CU\*BASE Menu System

Cheft: Dawn Moore

#### Overview

This recipe outlines our goals for a brand-new way of a place of the traditional menu-driven nevigation, use home page with powerful search rapabilities and ne according to each person's responsibilities and prefe

Barrowing techniques from the online tools your en this new style of navigation means that CU\*BASE ca need, quickly and intuitively. And it will show you at overwhelming you with what you carry, while still reshould be share.

For credit union security administrators, the project configuring employee security settings to control with access, and provides some great new helps for cred to track what users can do.

- S300 Crill Report Tools for CURBA

system/

About

Events -

n This Section

in the Alathen

TILA RESPANSION



## INSPIRED BY BIG DATA: UNDERSTANDING WHAT EMPLOYEES DO

- What kind of operational data analysis might you do if you could tell exactly what features employees are using, the frequency of use, and what features they try to use but can't?
- Now take that up a notch and imagine seeing how peer credit unions use the software, and then think about how we will use the data for creating and retiring tools?

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Auditing Functions (MNAUDT) #2 Audit Insider/Employee Activity

## M-UP IS THE NEXT BIG DATABASE UPGRADE

- The follow-up to FEP, this is a project with our clients to rethink data about members as people
- It's not just about what to store or how big the fields should be, it's also about incorporating new concepts about data management from our programming teams

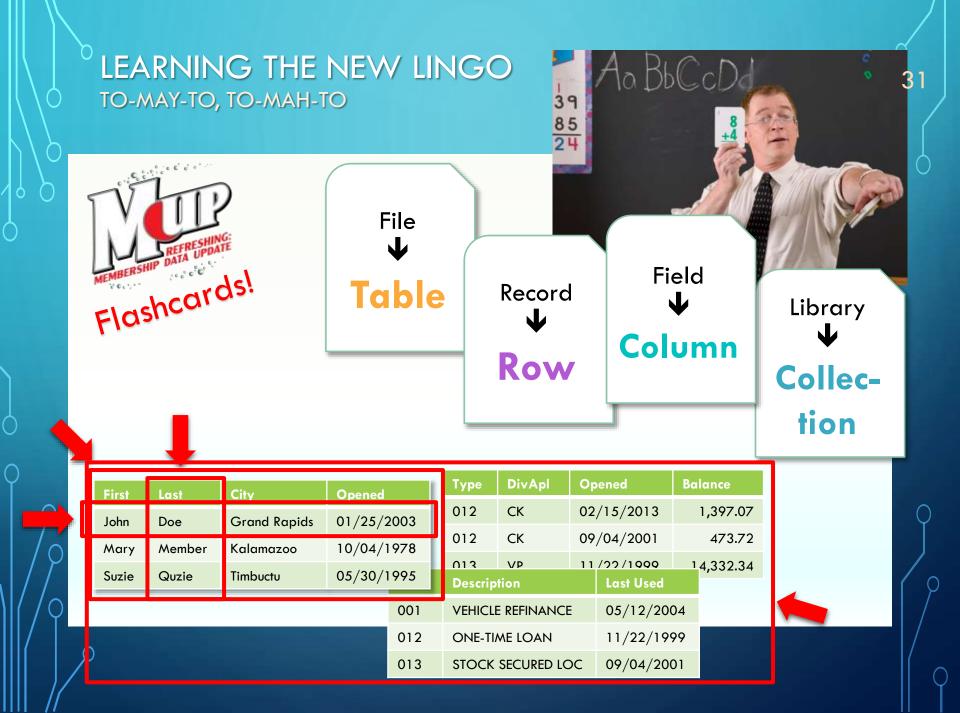


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**Business Servicing Fee Packages** 

CPS integration

- associated files to meet the needs of our growing d future. Unlike FEP, this project will also add numerout members to me membership database. • To branch out from the traditional "name, rank, and serial number" details to
- To market fact room the continual name, and service an actively bears to include social and life-cycle data to help a credit union manage their member relationships as well as their interactions with members via online and social media channels.



## WHEN IS A "COLUMN" NOT A COLUMN?

File Edit Tools	HASE GOLD Edition - II Help Or Active Me	mbers	_							
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	new	term	s begin pop	oping	up	← → ↑ 0 ± 2 7 2 3	( understell	owy c. second		49 (pacit) 20 Miles

## POP QUIZ: NAME 5 CHANGES YOUR CU NEEDS TO BECOME DATA-ENGAGED

- How could you test the level of data engagement you have among your team members?
- Does your credit union have some form of cost-reward analysis for hunting for data insight?
- What would happen if you pushed back on data request projects and distributed more of the work in getting data out of the system?
- Have you checked out the new Building the Factory toolkits from CMS? Do you know what the phrase "jobs to be done" means?
- If CU\*Answers would do anything you wanted related to data, what would it be?

### FOCUS GROUP INPUT ROUND 2: RANK YOUR CREDIT UNION

Rank your credit union from 1 to 5 (5 being highest) as to your credit union's effectiveness in managing data for success

Tell the group 2 things you think you could do to raise this ranking

## GETTING DATA OUT OF CU\*BASE

TOOLS YOU ALREADY HAVE

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## GETTING DATA OUT OF CU\*BASE

- When it comes to get data out of a database, people seem to want everything to happen via today's hottest method
  - Reports, query, or direct downloads, click-and-drag FTP exchanges, etc.
- Teams have a tendency to throw the baby out with the wash and retrain everyone to the latest thing
- Have you taken the time to analyze which method fits a specific team? A specific request?
  - How have you mapped your need to move data from inside a database to the myriad places and reasons that need data?

Let's consider one of the most aggressive filters in CU\*BASE today for finding specific opportunity...

# TALK ABOUT YOUR FILTERS...

Session 1 CUPBASE GOLD Edition - FRANKENMUTH CREDIT UNION File Edit Tools Help

#### Member List Generator

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End Selection

Select by	-	Includelt	xclude	Low
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**Member Communication** (MNPRTC) #5 "List Generator"

Exclude Does not mailer Include 3ed-party opt out flag Exclude CU contact opt out flag Include Does not matter 6.00 Select In Marketing club types Membership designation Session 1 CLPBASE GOLD Edition - FRANKENMUTH CREDIT UNION File Edit Tools Help Member List Generator Select Accounts WITHOUT Divident application(d) Certificate type(x) Any Loan/LOC Category(ins) Any (debo) tsuborg 870

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Session 1 CLPBASE GOLD Edition - FRANKENMUTH CREDIT UNION

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File Edit Tools Help

Membership type

Foreign addresses

plant by Wrong addresses

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State

**ZIP** code

Member List Generator

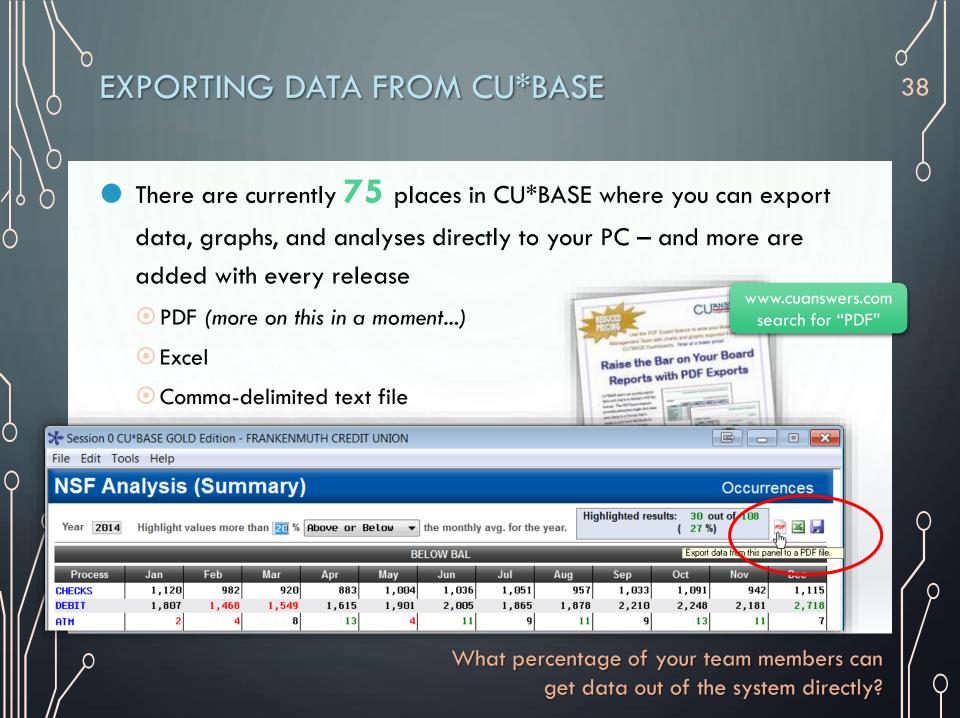
One of the next big projects for the Analytics programming team

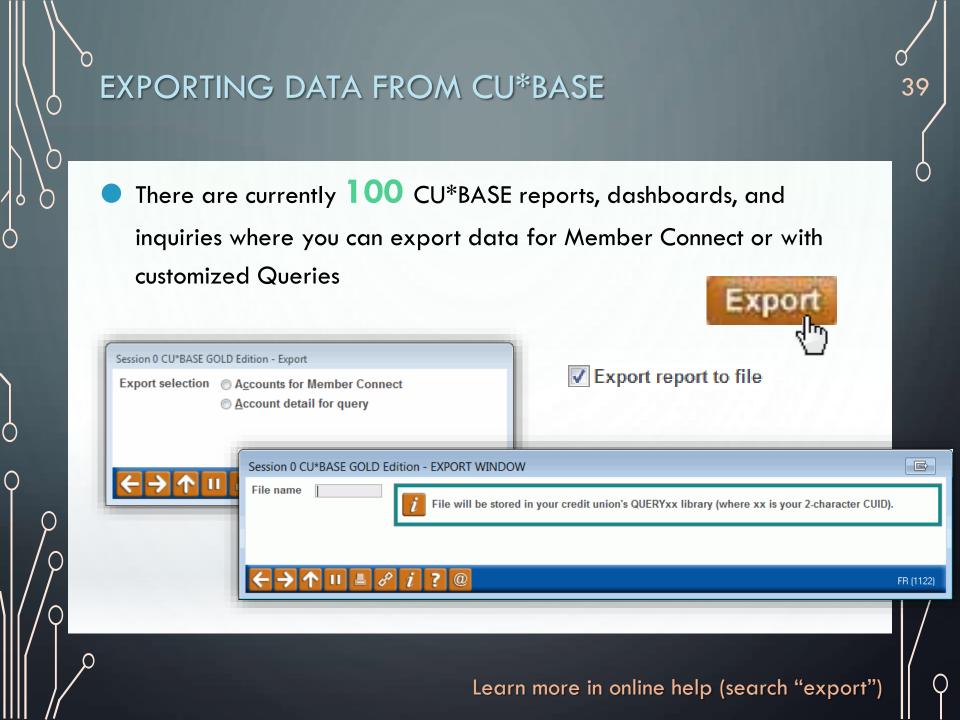
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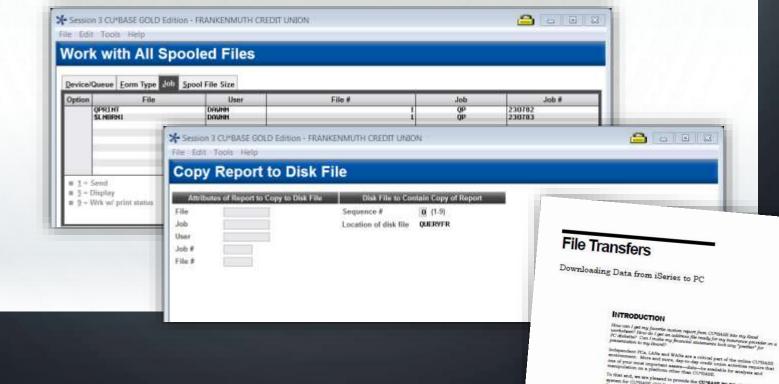
Member/Non-member Selection







presentation or used for additional analysis



that end, we are pleased to provide the CUMBASE PC File Tr has soit, we are pleased to provide him the band of and easily to see for CUMBARE COLD users. Data can be quickly and easily to a CUMBARE illeries files to your PC, for use in today's most near

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# OTHER TOOLS THAT MOVE DATA OUT OF CU\*BASE

#### ALM Downloads

- McQueen by McQueen Financial Group
- CUPRO by CUNA Mutual Group
- PROFITStar<sup>®</sup> (through a partnership with CUNA Mutual Group)
- OCU/ALM-Ware® by Brick & Associates
- Databridge by Compass
- AIRES Files

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- Direct file transfers from QUERYxx to your PC
  - 5300 file transfers direct to the NCUA site
- CTR forms to FinCEN

Working With AIRES	
and CU*BASE	
(The Automated Integrated Regulatory Examination System)	_
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INTERODUCTIONS And the second	Anutr Russmonn Manu (AGRUA) v Kagazanama pan (Grant) Pana 5 5

# **EXPORTING DATA TO THIRD PARTIES**

- Daily member notice data to print vendors
- Reports to archival servers
- Statement data to print vendors and archival servers (member, credit card, mortgage)
- OTB payment sweeps (mortgage loans, credit cards, etc.)
- Rewards checking daily vendor extracts (account info, transactions)
- Membership, account and transaction extracts (Marquis)
- ACH returns (Feds and third-party vendors)
- Member Reach messages
- Bill payment enrollments and maintenance
- ATM/debit/credit card orders and maintenance

- ATM/debit/credit card positive balance files (PBFs)
- Member Connect (CUNA and SerTech)
- CUNA Loan Tracker
- Member check/draft returns
- Corporate check reconciliations
- Loan lien information (Dealer Track)
- Loan CPI (insurance) information
- Escrow and real estate data (InfoPro)
- CASS certification (send addresses for certification)
- Credit bureau reporting





MARQUIS

Today these are generally custom, but we've done a poor job of sharing what is possible in a network...and that's going to change

> Look for more information at the June Leadership Conference

# **REPORT AND QUERY SCHEDULER**

#### **Retrieve Settings**

Save Settings

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Session 1 Report nan

Enter a ne NEW

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\* Session 1 CU\*BASE GOLD Edition - FRANKENMUTH CREDIT UNION

File Edit Tools Help

#### **Report Automation: Standard Reports**

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Search for description containing

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# POP QUIZ: HAVE YOU MATCHED THE METHOD TO YOUR MADNESS?

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# POP QUIZ: HAVE YOU MATCHED THE METHOD TO YOUR MADNESS?

- What data extracts do you wish happened while you were not at work?
- What things would you like to be able to put into the Report and Query Scheduler?
- What things would you like the CU\*BASE Operations team to handle for you, and where should the data go (third-party vendors)?

# Meet

45

# "DEX"

Database Exchange services from CU\*Answers

Look for more information at the June Leadership Conference

# GETTING DATA OUT OF CU\*BASE

NEW TOOLS WE'RE WORKING ON

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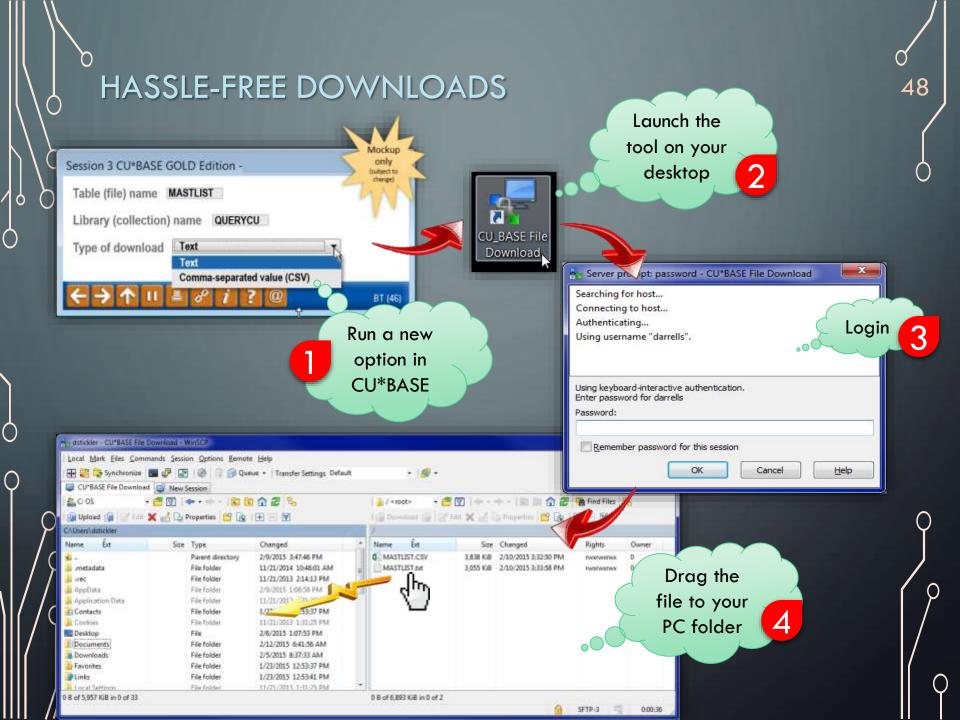
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#### THE NEXT BIG THING IN PDFs EXPEDITING ON-DEMAND REPORTS TO CU\*SPY FOR PDF OUTPUT Coming later this year! Any report you can print\* can be sent to the new ASAPxx printer queue (like HOLDxx) \*Except for forms with overlay, checks, receipts A new program monitors these queues for incoming files and moves them quickly to CU\*Spy, ready to view or print Job queue • Still TBD: How long retained? Archived to CD? Copies 1 Next up: In-house eDOC vaults – will require some Printer ASAPXX new configs already in development

2	All Reports End of Month General Lr	Third Party ASAP
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## S-FREE DO

Session 3 CU\*BAS Table (file) name MA Library (collection) name

This tool relies on the ability of your credit union's network administrators to configure an environment that easily allows CU\*BASE to transfer documents in this manner

It'll take a bit of patience as you start to use this feature, where your network and ours have to be ready to partner







49

Login

# <sup>b</sup> CONTINUING TO EXPAND THE REPORT & QUERY SCHEDULER

- Report automation Phase 2
  - 12 more reports coming in the 15.0 release in April
- Learn more in the <u>Automated</u>
   <u>Reports and Queries</u> booklet
- In process and coming this fall:
  Run monthly on your chosen day
  Check out the Kitchen for a prototype:

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Remember that you still need to monitor your automated reports every month to make sure the settings are what you expect



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\$300 Call Report Tools for CU\*BASE

next business day (such as Monday)

# PULLING EXTERNAL DATA INTO CU\*BASE

TOOLS YOU ALREADY HAVE

### PULLING EXTERNAL DATA INTO CU\*BASE A CHANGING WORLD

Most data that comes from the outside world into CU\*BASE is through some kind of fixed CU vendor relationship that CU\*BASE facilitates

• EFT, check processing, indirect lending networks, credit bureaus, etc.

- Occasionally we pull in data that helps you audit a vendor alliance related to some CU\*BASE processes
  - Audit stats about statement processing from Sage, etc.
- But the more we develop analysis programs designed to give a CU insight into member relationships, the more requests we get to include external data with our CU\*BASE data for a bigger picture

Hopefully OTB comes to mind...if not, in a moment we'll discuss a whole new wrinkle called TotalLook

Import	<u></u>	Session 3 CU*BASE GOLD - Import file to Pro File to import Defaults Reference Dept/SponsorQ	Membership Applications (MNSERV #21)
Session 3 CU*BASE GOLD Edition - I Option Flat User-defin File to import Defaults: Source Description			BT (5596)
	Session 3 CU*BASE GOLD Edition - Import file to Post Option  ACH Flat User defined fixed format User File to import Defaults: Transaction Deposit Payment Withdrawal Description IRA/HSA code	defined comma delimited Mail/Direct Post (MNSERV #2)	
Session 1 CU*BASE GOLD - Im File to import Import format  Flat file, pre-define Flat file & i	port CU Budget ed OUser-defined fixed file OUser-defined comma-delimited	Work with CU Budget (MNBUDG #17) BT (5569)	(3869)

# OTHER TOOLS THAT MOVE DATA INTO CU\*BASE

- Direct file transfers from your PC to QUERYxx or a CU\*BASE file
- Receiving files from FinCEN/OFAC, FIDM, and the like
- Statement audit/mailing information (from Sage or other vendors)
- OTB balance and status data (more on this in a moment)

	Processed Date	Deep Date	Туре	Pages	Regular Inserts	Selective Inserts	Weight	Low	High	Additional
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# IMPORTING DATA FROM THIRD PARTIES

- Rewards checking vendor pass/fail and ATM surcharge rebate files
- ACH incoming items (Feds and thirdparty vendors)
- Payroll files
- ATM/debit/credit card reconciliation report information
- Credit card rewards information (for presentation on statements)
- Remote deposit check (RDC) items
- Bill payment billing information

Insurance premium posting files

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- Member check/draft clearings
- Corporate check clearings
- CASS certification (apply address changes)
- Credit bureau pulls (interactive, soft, batch)

EQUIFAX

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As with the exports, these are generally custom, but we need to do a better job of sharing what is possible in a network

> Look for more information at the June Leadership Conference

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# PULLING EXTERNAL DATA INTO CU\*BASE

NEW TOOLS WE'RE WORKING ON

# TOTALLOOK IS THE GOAL, OTB IS THE ENGINE TO GET THE WORK DONE

- How do we all keep the costs for third-party data integrations reasonable? You build a platform that does 85% of the work before you even know the name of the vendor – that's OTB
- How do you share a member's total relationship with the CU through online banking and mobile banking in the future? – that's OTB
- How do you allow management to get the big picture through CU\*BASE dashboards and include third-party relationships in those tools? – that's OTB
- OTB is an import platform that credit unions can customize to any third party that will share data for a reasonable investment

TotalLook is a way to make the CU\*BASE data warehouse <u>the</u> credit union warehouse

### OTB = OFF TRIAL BALANCE

VS. MEMBER DATA THAT IS ON TRIAL BALANCE INSIDE THE CU\*BASE DATABASE

- The accounts you service through CU\*BASE create the data you count on when looking at your members
  - Historically, this was always presented via some variation of a Trial Balance format
- The accounts you service via third party servicing platforms have similar tactics for reporting member data
- Our OTB platform is designed to allow you to merge third-party data with CU\*BASE processing tools to get a bigger picture of the member – a TotalLook

## INTRODUCING TOTALLOOK

KEEPING THE TOTAL MEMBER PICTURE IN MIND AND CENTRALIZED THROUGH A CU\*BASE PRESENTATION

- A tactic to meet the challenges of servicing members via multiple vendors and merging the data for better execution
- TotalLook leverages the CU\*BASE OTB solutions suite:
  - **OTB Master Data** adding account data from a third party into CU\*BASE so members and employees can access it
  - OTB Transaction Data adding transaction data from a third party into CU\*BASE so members and employees can access it
  - **OTB SSO** linking from online/mobile channels to third-party tools
  - OTB Payments creating a portal to accept payments from members
  - OTB Analytics merging third-party data into delinquency, relationship management tools, etc.

# CU\*BASE ALLOWS YOU TO DESIGN NEW WAYS TO AGGREGATE DATA IN OUR WAREHOUSE

Standing Tactics	Our Goals
OTB Master Data	Use more of the vendor-provided data and make our CU*BASE displays smarter
OTB Transaction Data	Go beyond the account data and display what's happening
OTB SSO	Increase the number of links between CU*BASE and the vendor so employees and members can drill down even further
OTB Payments	Expand the number of ways members can make payments to OTB accounts
OTB Analytics	Prioritize the dashboards that need third-party data to give a total picture of member relationships and what they mean to the CU

# OTB TRANSACTION DATA

- Giving members a TotalLook
  - Adding transaction history to the OTB account info in online and mobile banking channels
- Giving employees a TotalLook
  - Pulling a member's OTB accounts and transaction history into CU\*BASE Inquiry and Phone Operator tools

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<u>`</u>			610	USED VEHICLES	s	6,0	79.31		128.11	7/02/14		•		
)		BSS 🚬	*15	MORTGAGE LOA	AN	1,2	06.20	)	107.54	6/15/14				

nmediately reflect recent transac	change)
Account #:	
hibitution/Agency:	THE MORTGAGE SUPERSTORE
Description:	30 VR FIXED MORTGAGE
Delinquent?	Yes:
Amount Past Due:	\$1,026.50
Next Fayment Due Date:	6/1/2011
Payment Amount:	\$1,026.50
talance:	\$132,768.91
Disbursement Limit:	\$150,000.00
Maturity Date:	4/10/2010
Last Payment Date:	7/1/2011

# EXPANDING OTB PAYMENT OPTIONS

Deposit \$ into savings account, system sweeps to OTB in batch		
al		
Withdrawal from member account		
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Put your employees to work and make it easy for your members

# ADDING OTB DATA TO EXISTING AND NEW **CU\*BASE ANALYTICS TOOLS**

- A long time ago, we added OTB data to the Collections dashboard – this is just a new process to continue on that same track
- Next up: Adding OTB loans and credit cards to the Loan **Concentration Risk Analysis**
- Then what? It's up to you: prioritize your dashboards and prioritize your vendors

### **Collections Member Inquiry**

Coll	Contacted				Memo	
ID	Yes	Mo/Day	Account #		Туре	
BK			50	798		E
*0			93	OTB	XX	E
*0		Apr 23	79	OTB	RE	M
AA		Jan 26		772	RE	
BB		Jan 20	96	700		M
DD		Apr 21	35	771	MS	T
BK			56	798		C
EE			17	798		K
LO			91	798		K

#### Session 1 CU\*BASE GOLD Edition - ABC CREDIT UNION

File Edit Tools Help

#### Loan Concentration Analysis

Loan category A selected

Outstanding loan balance greater than

Loans to include A O All loans CU owned portion of all loans Investor owned portion of all loans

Loan balance 126,631,504

Hł										
I			Credit	Loan		Open				
H	S SN/TIN	Member Name	Score	Balance	Disbursement Limit	End				
Ш	***-**-	SCO	685	689,004	1,022,051	*				
Ш	***-**-	R.	0	660,917	700,000					
Ш	***-**-	WIL	776	442,082	452,050	*				
Ш	***-**-	ERI	728	415,856	417,000					
	***-**-	CAR	0	413,621	414,262					
	***-**-	TNG	748	380 007	382 600					

### FOCUS GROUP INPUT ROUND 3: WHAT ARE YOUR GOALS?

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In less than 3 sentences, what is your goal for how better data management could change your credit union? Give a quick idea about what • Management could do to improve • Supervisors could do to improve Staff could do to improve • CU\*Answers could do to improve

# Time for lunch!

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# EXTERNAL DATA WAREHOUSES

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UNDERSTANDING WHERE DATA IS STORED AND HOW IT MIGHT BE LEVERAGED FOR YOUR GOALS

## GETTING MORE SPECIFIC ABOUT THE TERM "DATA WAREHOUSE"

#### From Wikipedia.org:

In computing, a data warehouse (DW or DWH), also known as an enterprise data warehouse (EDW), is a system used for reporting and data analysis. DWs are central repositories of integrated data from one or more disparate sources. They store current and historical data and are used for creating trending reports for senior management reporting such as annual and quarterly comparisons.

The data stored in the warehouse is uploaded from the operational systems (such as marketing, sales, etc., shown in the figure to the right). The data may pass through an operational data store for additional operations before it is used in the DW for reporting.

- Based on this definition, everything we talked about this morning is based on leveraging an operational data store
- Is it time for your CU to think about a classic enterprise data warehouse?

Most CUs simply focus on gaining a better understanding of operational databases and what they mean to their success

### WHEN PROCESSING WITH CU\*BASE OUR DATABASE IS A HYBRID: WE DO IT ALL

### Production IBM i

- FILExx and QUERYxx
- In Grand Rapids, Michigan, for online CU\*Answers clients
- In Yankton, South Dakota, for cuasterisk.com network partners
- In each credit union location for in-house (self processor) clients

#### High Availability IBM i (Live Replicated Data)

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- FILExx and QUERYxx
- In Muskegon, Michigan, for online CU\*Answers clients
- In Grand Rapids, Michigan for cuasterisk.com network partners
- In various locations depending on each in-house client's DR/BR plan

We started our analytics focus to help CUs reduce their need for an enterprise data warehouse

# EXTERNAL DATA WAREHOUSE: MY CU TODA

- My CU Today still contains only CU\*BASE data, but in the future we may see data from other systems and even other cores
- My CU Today is based on using daily snapshots to trend forward based on any period the user wants to see (weekly, monthly, quarterly, etc.)
- My CU Today removes personal information and is based on trending "safe" data
- My CU Today is based on an open environment to allow a broad and diverse audience (boards, third-party commentators, etc.) for analyzing trends

My CU Today is an external data warehouse, and one where CU\*BASE clients can master ideas related to EDWs

### WHAT DO CREDIT UNIONS NEED? WHAT CAN CREDIT UNIONS EARN ON?

- As we prepare for the future, what kinds of EDWs will credit unions see as required for their operations and their success?
- CU\*BASE data replicated into alternative methods of storing data that might provide more independent analytical tools and approaches – "I prefer using different tools"
- CU\*BASE data replicated into data warehouses so that the CU can archive data based on their preferences for timing, investment, and purge schedules – "I need a different retention schedule"
- CU\*BASE data replicated into data warehouses that have other sources of data to create broader analysis over disparate sources of credit union related data – "I need to mix and match different data"

The success of our CUSO as a collective is knowing to share in these investments and when to go after them independently

#### **INTRODUCING ONAPPROACH** LET'S HEAR WHAT PAUL ABLACK HAS TO SAY ABOUT ENTERPRISE DATA WAREHOUSES

- Did you catch this interview? What did you think?
- We're lucky today to have Paul here with us...let's have a conversation



# XOnApproach

FOR IMMEDIATE RELEASE

#### OnApproach CEO, Paul Ablack, Featured on CUBroadcast

Plymouth, MN (February 16, 2015) - OnApproach (www.onapproach.com), a leading provider of Big Data and Analytics for credit unions, is pleased to announce that its CEO, Paul Ablack, appeared on CUBroadcast to discuss how credit unions can leverage their data to better serve their members.

To get the inside scoop on how today's Big Data has evolved, CUBroadcast invited OnApproach's Founder and CEO, Paul Ablack, to appear on the program and divulge his expertise in the Big Data arena. Paul not only provides great insight on this information evolution, but he also gives a couple eye-popping examples of how credit unions are benefiting from this information revolution.

View the video here: http://blog.onapproach.com/video-how-credit-unions-canleverage-big-data

> http://blog.onapproach.com /video-how-credit-unionscan-leverage-big-data



# POP QUIZ: ENTERPRISE DATA WAREHOUSES... WHERE DO WE GO FROM HERE?

- How many of you feel your org wants to pursue an independent EDW?
- Where would you house your EDW?
- What process do you think you would use to replicate the data to your EDW?
- What budget do you have for maintaining your EDW?
- Have you picked a set of tools you think would be most effective for you in using your EDW for analytics?
- Have you identified any other disparate databases that you would like to include in your EDW along with CU\*BASE?

2015 is the year to talk about the future of EDWs and what our CUSO should be thinking about



# POP QUIZ: ENTERPRISE DATA WAREHOUSES... DO YOU ALREADY (KIND OF?) HAVE ONE?

- Do you have a homegrown data warehouse where you collect any data?
- Did it start out with a goal to be an EDW?
- Have you added any other kinds of data to it?
- What do you use your data warehouse for?
- Do you think DEX will help you in populating your data warehouse?
- What is next for your data warehouse?
- What kind of customer service do you have for your managers and team members when they request things from your data warehouse?

2015 is the year to talk about the future of EDWs and what our CUSO should be thinking about

# AFTERNOON WRAP-UP

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# THE CU\*BASE 15.0 RELEASE IS COMING SOON!

- Beta begins March 8 with:Heartland CU (Madison)
  - Ohio Catholic FCU
  - Pathways Financial CU
  - Sarasota Municipal
     Employees CU
- Release goes to all online CUs & Site-4 on

April 19

(to self processing CUs May 11&12)

- 15.0 is chock full of cool stuff:
  - For members in online banking: Credit scores, password change reminders, Qualified Dividends status

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- New history and dashboard for written-off/charged-off loans
- Email notifications to staff when underwriting status changes
- New Fee Waivers by Employee, Fee Refunds, and Cross Sales analysis dashboards
- ...and lots more!

Watch for the release announcements coming soon!

# APPENDIX

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A FEW EXTRAS TIDBITS

## DB2 AND CU\*BASE

The DB2 product remains a major focus in the IBM development portfolio

#### **DB2 Encryption Update**

#### Keep DB2 Data Assets Safe

New

- NEW native encryption of data stored in DB2
- Protect DB2 data assets and meet organizational and re requirements without the expense and complexity of no encryption solutions
- Industry compliant (meets the requirements of NIST SP 800-131 compl cryptographic algorithms and utilizes FIPS 140-2 certified cryptographic librarie



- Included in Advanced Workgroup and Advanced Enterprise Editions
- Available as add-on to Enterprise, Workgroup, and Express Editions

SAP

11%

2004

2004

2008

Significant Market Share Growth

**DB2 Growth Trends and Client base** 

31%

2013

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## HOW WE'RE LEVERAGING DB2

- DDL (Data Definition Language) used to build tables
- DML (Data Manipulation Language) used to create/read/ update/delete data in tables (yes, that's CRUD)

- Embedded SQL
  - New online banking API system will be pure SQL data CRUD
  - The near-time alerts system
  - Parts of the It's My Biz 247 system
  - Parts of the dashboard system
  - Parts of the ISO system
  - Some reports

# HOW WE'RE LEVERAGING DB2

- DCL (Data Control Language) implements security functions as well as constraints
  - Constraints make sure our data is clean and meets vendor expectations
  - Any new DDL tables we create use constraints, such as the new vendor notices flat file project

#### Procedural Language

- Includes triggers, stored procedures, user-defined functions
- Ourrently we only use user-defined functions, which are limited
- While online banking does implement some stored procedures they are not SQL stored procedures, they are "external" stored procedures

# HOW WE'RE LEVERAGING DB2

Will be implemented soon:

- TCL (Transaction Control Language) aids in updates/inserts on table groups with hierarchies
  - The new API system will take advantage of transaction control, so that when a user logs in, all audit and tracking tables will update at the same time – any point of failure will institute a roll-back, keeping all tables in synch

### DDL VS. DDS THE SAME BUT DIFFERENT

- Both are used to define a database table, but...
- DDL is the industry standard
  - All IBM investment dollars now go to the SQL languages, which includes DDL
  - DDS (IBM proprietary) has matured and IBM is no longer investing research dollars into improving DDS files

- DDL has more data types
  - Pictures
  - Documents
  - Database maintained columns (last update timestamp, sequence numbers)

- Column encryption
- RCAC (row and column access control)
- Implicitly hidden columns (such as passwords, or data meaningless to end-users)

### DDL VS. DDS THE SAME BUT DIFFERENT

- DDL tables let us be more
  reactive to changing needs
  A DDL table can be altered,
  vs. changing DDS file where
  we have to destroy the DDS
  described table (file) and
  all its dependents, then
  rebuild
- A DDL table's components can also be altered (keys, constraints, partitioning)

DDL provides better performance

- Data is typically read more than it is updated/deleted/created
- Since a DDL table's data is verified on the way in to the database table, it is not verified on the read (DDS is the other way around: verified on the read)
- Access path size is 64K vs. 8K (it's like the HOV lane on the expressway—you can push a lot more data through that lane)