25TH ANNUAL
INNOVATIVE USERS GROUP
CONFERENCE

APRIL 2-5, 2017

Digging into Resource Sharing:

Leveraging the Transaction File

Debbi Schaubman, MCLS
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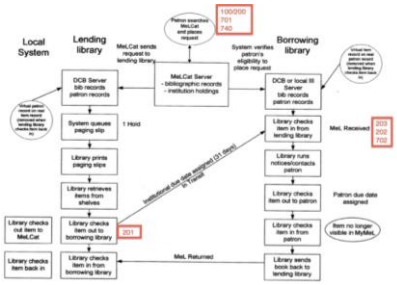
Introductions

- Debbi Schaubman
- MCLS (MeLCat)
- 416 member libraries
  - Multi-type
- Theda Schwing
- OhioLINK (Central Catalog)
- 121 member libraries
  - Academic

What is a Transaction File (and Where Can You Find One)




```
100|307087|sv194|sg022|ms:Mason:Capital Area District Library|200|200|Skjoldebrand,
Ingerlise,|The treasure chest of Swedish weaving / by Ingerlise Skjoldebrand ; in
collaboration with Olle H. Samson, art director ... ; Richard Spangle, English
translation ... [et al.].|PT 848 .85813 1983|1643977|06122900100||
203|300872|sv035|sv194|||200|Loggins, Kenny.|Unimaginable life : lessons learned on the
path of love / Kenny and Julia Loggins.|920 Log|1293590|06122909470?||
203|302718|sv052|sv194|||200|Fletcher, Colin|Count your cookies / by Colin Fletcher ;
illustrated by Jane Massey|J PICTURE BOOK FLE|406122|06122914022||
100|307375|sv194|sv052|fo:Foster:Capital Area District Library|201|||||1476596|
06122913574?||
201|307256|sv052|sv194|hold:Canton Pub Library:Canton (via TLN 500-0056)|203|200||Michigan
Humane Society : animal welfare in Detroit, 1877-2002 / Michigan Humane Society.|636.0832
Michigan|1935329|06122916154?||
201|306917|sv012|sv194|wv:AADL-West Branch:Ann Arbor District Library|204|200|Perry, Sara.|
Holiday baking : new and traditional recipes for wintertime holidays / by Sara Perry ;
photographs by Leigh Beisch.|641.815 Perry|2230261|06122908452?||
201|306906|sv012|sv194|pa:AADL-Pittsfield Branch:Ann Arbor District Library|204|200|Handel,
Nelson.|Reaching out : the guide to writing a terrific Dear Birthmother letter / Nelson
Handel ; foreword by Carol LieberWilkins.|362.734 Handel|2083998|06122908454?||
203|303584|sv012|sv194|||200|Richardson, Alan, 1951-|Ancient magicks for a new age :
[rituals from the Merlin Temple : the magick of the dragon kings] / Alan Richardson and
Geoff Hughes.|133.43 Ri|1180146|06122913330?||
106|307113|sv194|sv012|||||1481888|06122916314?||
902|307285|sv194|sv225| ll:Lansing:Capital Area District Library|200||George, Jean
Craighead, 1919-|Frightful's mountain [sound recording] / by Jean Craighead George.|FIC
George|12533024|06122916085?||
```

100	307087	zv194	zg022	ms:Mason:Ca	200	200	Skjoldebrand,	The treasure c	TT 848 .S5811	1643977	061229001008
203	300872	zv035	zv194			200	Loggins, Kenn	Unimaginable	920 Log	1293590	061229094707
203	302718	zv052	zv194			200	Fletcher, Colin	Count your co	J PICTURE BO	1406122	061229114022
100	307375	zv194	zv052	fo:Foster:Cap	201					1476596	061229135747
201	307256	zv052	zv194	hold:Canton I	203	200		Michigan Hum	636.0832 Mic	1935329	061229161544
201	306917	zv012	zv194	w:AADL-West	204	200	Perry, Sara.	Holiday baking	641.815 Perry	2230261	061229084528
201	306906	zv012	zv194	p:AADL-Pittsf	204	200	Handel, Nelso	Reaching out	362.734 Hand	2083998	061229084544
203	303584	zv012	zv194			200	Richardson, Al	Ancient magic	133.43 Ri	1180146	061229113301
106	307113	zv194	zv012							1481888	061229163145
502	307285	zv194	zv225	ll:Lansing:Ca	200		George, Jean	Frightful's mo	FIC George	12553024	061229160855

Field #	Field Name	Field Description
1	Transaction Type	Code that represents the INN-Reach action that resulted in the transaction message
2	Transaction Number	Unique number assigned to all transactions; associated with the request throughout its lifespan
3	Patron Agency *	Agency code of the patron library
4	Owning Agency *	Agency code of the owning library
5	Pickup Location	Location code of the pickup location: Pickup location: Delivery stop
6	Central Server Patron Type	AKA Central Server "ptype"
7	Central Server Item Type	AKA Central Server "itype"
8	Author	
9	Title	
10	Call #	The call number of the item as provided in the owning library record. If no call number in the item record, the call number is taken from the associated bib record.
11	Item Record	Item record number on the owning library system/DCB server
12	Message Time	Time of message (yymmddhhmmss format)
13	Pickup Anywhere Location Key	Blank field (used for a service not currently provided by MeLCat)

Event	Transaction Type	Transaction Name
New Request	100	Item request (across servers)
	200*	Item information
	240	Item information (NCIP; across servers)
	701	Item request (same local server)
	740	Item request (NCIP; same local server)
Fulfillment	201	Item put In Transit
	202	Insert Barcode procedure used
	203	Item checked in at borrowing library
	205	Visiting patron checkout
	702	Insert Barcode procedure used (same local server)
Re-Request	204*	Item re-requested (across servers)
	704*	Item re-requested (same local server)
Cancellation	106	Patron-initiated cancellation
	502	Final cancellation

Type	Trans. Num.	Patron Agency	Owning Agency	Pickup Loc.	Ptype	Itype	Auth.	Title	Call Num.	Item Rec.	Date
100	✔	✔	✔	✔	✔	⊛	⊛	⊛	⊛	✔	✔
106	✔	✔	✔	✖	✖	⊛	⊛	⊛	⊛	✔	✔
200	✔	✔	✔	✔	✖	✔	✔	✔	✔	✔	✔
201	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
202	✔	✔	✔	✖	✖	✖	✖	✖	✖	✔	✔
203	✔	✔	✔	✖	✖	✔	✔	✔	✔	✔	✔
204	✔	✔	✔	✔	✖	✔	✔	✔	✔	✔	✔
205	✔	✔	✔	✖	✖	✔	✔	✔	✔	✔	✔
240	✔	✔	✔	✔	✖	✔	✔	✔	✔	✔	✔
502	✔	✔	✔	✔	✔	✖	✔	✔	✔	✔	✔
701	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
702	✔	✔	✔	✔	✖	✔	✔	✔	✔	✔	✔
704	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
740	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔


```
20|4342770|zc014|zc015|t2:TLC Circulation Desk:zc014 Lansing Community
Coll|200|Hames, Joanne Banker.|Legal research, analysis, and writing /
Joanne Banker Hames, Yvonne Ekern.|KF240 .H36
2009|2546521|110830175949||

10|4342770|zc014|zc015|t2:TLC Circulation Desk:zc014 Lansing Community
Coll|212|200|Hames, Joanne Banker.|Legal research, analysis, and
writing / Joanne Banker Hames, Yvonne Ekern.|KF240 .H36
2009|2546521|110830175949||

50|4342770|zc014|zc015| t2:TLC Circulation Desk:zc014 Lansing
Community Coll|212|Hames, Joanne Banker.|Legal research, analysis, and
writing, 3e / Joanne Banker Hames, Yvonne Ekern.|KF240 .H36
2009|2546521|110831101118||
```

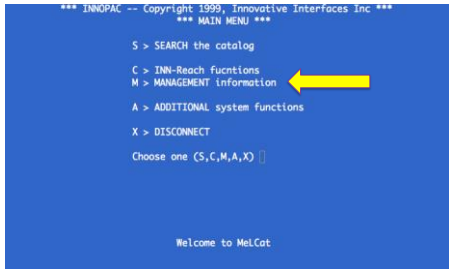

MeLCat ITYPEs

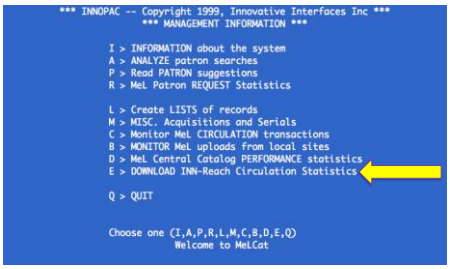
Itype Code	Meaning
200	Book
201	Sound Recording
202	Video Recording
203	Audio-Visual (not otherwise specified)
204	Library for the Blind materials
205	Kit
206	Map
207	Microform
208	Periodical
209	Realia
210	Software
211	Assistive Device
212	Video Recording (Short Loan)
213	Audio-Visual (not otherwise specified; Short Loan)
214	Sound Recording (Short Loan)
239	Not Otherwise Specified

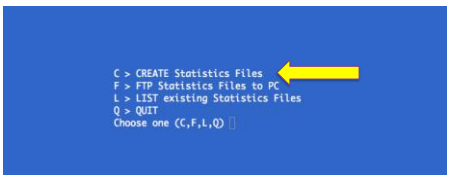
MeLCat PTYPEs

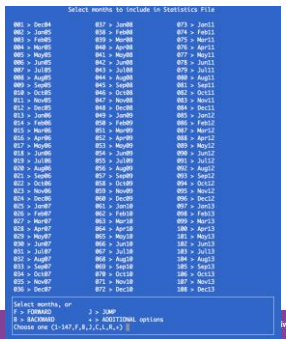
Ptype Code	Meaning
200	Public Library Adult (with AV privileges)
201	Public Library Juvenile (with AV privileges)
202	Corporation/Institution (with AV privileges)
203	Public Library Staff (with AV privileges)
204	Public Library Patron (not otherwise specified; with AV privileges)
205	*Student (no AV privileges)*
206	*Faculty/Staff (no AV privileges)*
207	*Adult (no AV privileges)*
208	*Juvenile (no AV privileges)*
209	*Generic/Unspecified type (no AV privileges)*
210	Test patron
211	Test patron
212	Undergraduate Student (with AV privileges)
213	Graduate Student (with AV privileges)

Description of lifecycle	Different servers	Same server (e.g., DCB1-to-DCB1)
Standard vanilla transaction	100 [200] 201 203	701 201 203
Borrowing library does "insert barcode"	100 [200] 202 203	701 702 203
Patron cancellation	100 [200] 106	701 106
Lending library cancellation (with request filled by another lender) *	100 [200] 204 [201]	701 704 [201]
Lending library cancellation (terminal)	100 [200] 502	701 502
Visiting patron	205	205
Vanilla transaction using NCIP for patron authentication	100 [240] 201 203	740 201 203




*** INNOPAC -- Copyright 1999, Innovative Interfaces Inc ***
*** MANAGEMENT INFORMATION ***
I > INFORMATION about the system
A > ANALYZE patron searches
P > Read PATRON suggestions
R > MeL Patron REQUEST Statistics
L > Create LISTS of records
M > MISC. Acquisitions and Serials
C > Monitor MeL CIRCULATION transactions
B > MONITOR MeL uploads from local sites
D > MeL Central Catalog PERFORMANCE statistics
E > DOWNLOAD INN-Reach Circulation Statistics
Q > QUIT
Choose one (I,A,P,R,L,M,C,B,D,E,Q)
Welcome to MeLCat


C > CREATE Statistics Files
F > FTP Statistics Files to PC
L > LIST existing Statistics Files
Q > QUIT
Choose one (C,F,L,Q)


Select months to include in Statistics File
001 > Dec04
002 > Jan05
003 > Feb05
004 > Mar05
005 > May05
006 > Jun05
007 > Jul05
008 > Aug05
009 > Sep05
010 > Oct05
011 > Nov05
012 > Dec05
013 > Jan06
014 > Feb06
015 > Mar06
016 > Apr06
017 > May06
018 > Jun06
019 > Jul06
020 > Aug06
021 > Sep06
022 > Oct06
023 > Nov06
024 > Dec06
025 > Jan07
026 > Feb07
027 > Mar07
028 > Apr07
029 > May07
030 > Jun07
031 > Jul07
032 > Aug07
033 > Sep07
034 > Oct07
035 > Nov07
036 > Dec07
037 > Jan08
038 > Feb08
039 > Mar08
040 > Apr08
041 > May08
042 > Jun08
043 > Jul08
044 > Aug08
045 > Sep08
046 > Oct08
047 > Nov08
048 > Dec08
049 > Jan09
050 > Feb09
051 > Mar09
052 > Apr09
053 > May09
054 > Jun09
055 > Jul09
056 > Aug09
057 > Sep09
058 > Oct09
059 > Nov09
060 > Dec09
061 > Jan10
062 > Feb10
063 > Mar10
064 > Apr10
065 > May10
066 > Jun10
067 > Jul10
068 > Aug10
069 > Sep10
070 > Oct10
071 > Nov10
072 > Dec10
073 > Jan11
074 > Feb11
075 > Mar11
076 > Apr11
077 > May11
078 > Jun11
079 > Jul11
080 > Aug11
081 > Sep11
082 > Oct11
083 > Nov11
084 > Dec11
085 > Jan12
086 > Feb12
087 > Mar12
088 > Apr12
089 > May12
090 > Jun12
091 > Jul12
092 > Aug12
093 > Sep12
094 > Oct12
095 > Nov12
096 > Dec12
097 > Jan13
098 > Feb13
099 > Mar13
100 > Apr13
101 > May13
102 > Jun13
103 > Jul13
104 > Aug13
105 > Sep13
106 > Oct13
107 > Nov13
108 > Dec13
Select months, or
F > FORWARD
B > BACKWARD
J > JUMP
+ > ADDITIONAL options
Choose one (1-147,F,B,J,C,L,R,+)

What to Do with 1 Million+ Lines of Data?

Processing in a Nutshell

- MeLCat
  - Central system staff
    - Query raw data A LOT
    - Sometimes output to file/manipulate in Excel
  - Teach class for MeLCat libraries
    - Basics of grepping formatted files
    - VLOOKUP, DATEDIF, NETWORKDAYS, COUNTIFS
- OhioLINK
  - Central system staff
    - Output to file/manipulate in OpenRefine and Excel

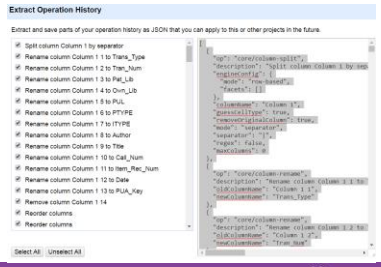
Importing the Data to Spreadsheets

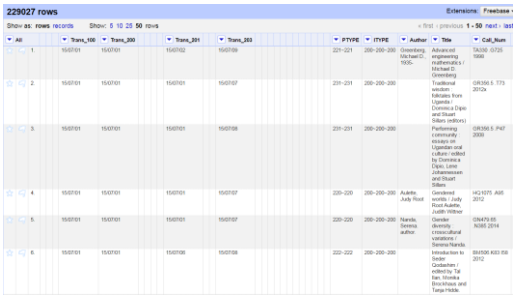
- The data structure makes this straightforward
  - Each line in a new transaction
  - Each transaction line has the same elements (some will be blank)
  - Pipe (|) delimiter is used between fields
- Spreadsheet tools make it easier to automate the processing
  - Excel's lookup tools, using multiple worksheets
  - OpenRefine's saved JSON steps, filtering

Data Cleanup

- Date Format Changes
  - Changing the date format from yymmddhhmmss to something more useable
- Column Changes
  - Re-naming your columns of data will save your sanity when trying to remember what data is in which column
  - Reordering the columns can also be helpful
- Spot Checking
  - Make sure that all the lines split into the number of columns that you were expecting

Automate Where Possible





The Data Look Great – Now What?

A First Pass at Turnaround Time

- Tracking items manually vs. through transaction dates
  - Two-week test period in 2015
  - From courier stop to courier stop, the average time was 2-3 days
  - From item-site-checkout to patron-site-checkin was just over 3 days
- Why don't the numbers match?
  - Different criteria for starting and ending dates
  - Data isn't exactly the same

MeLCat Turnaround Time+

Impact of change from 2 day/week to 3/day week delivery: borrowing

Median Change	# of pickup locations	% of total	# of 2013 transactions	# of 2014 transactions
6 day improvement	1	0.8		
5 day improvement	0	0		
4 day improvement	1	0.8		
3 day improvement	2	1.5		
2 day improvement	20	15.0		
1 day improvement	45	33.8		
No change	42	31.6		
1 day deterioriation	16	12.0		
2 day deterioriation	5	3.8		
3 day deterioration	1	0.8		
TOTAL	133		33,959	33,659

MeLCat AV vs. Print Requests

AV vs. print requests

	2014 - 2015		2015 - 2016	
Type of material	% of Requests	Fill Rate	% of Requests	Fill Rate
Books	73.4%	91.9%	72.1%	92.6%
AV	26.6%	88.7%	27.9%	84.2%

	# of Requests	Fill Rate
AV available for short loan period	161,829	77.8%
AV available for regular loan period	143,686	91.4%

MeLCat Terminal Cancellations and Overrides

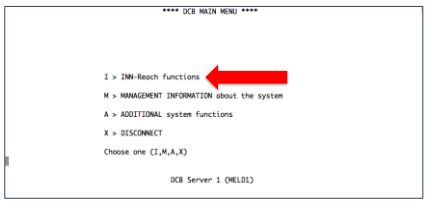
- Terminal cancellations due to autoforwarding
  - grep "|502|" *16olc | grep -c "Please try your request again"
- Abuse of the override function to renew items

```
[root@elibrary /home/share]# grep "|r17" 101msgs-counts | more
-11167378|szv143|pp1009335|r170309|21|d20170309040000|zv231
-11384526|szv139|pp11478429|r170228|17|d20170228040000|zv217
-11538858|szv083|pp15761713|r170202|7|d20170202040000|zv269
-11482521|szv306|pp15216119|r170306|7|d20170306040000|zv287
-11409415|szv353|pp1111439|r170310|7|d20170403040000|zv100
```

INN-Reach Mad Libs

- [Transaction Type] / [Event] x [Date]
  - How many re-requests happen by month?
  - Which was used more last year, PickupAnywhere or Visiting Patron?
- [Time between Transaction Types] x [Date]
  - How long is it typically between when a patron places a request and then cancels that request?

That's INN-Reach – What about Local Files?



```
*** INNOPAC -- Copyright 1999, Innovative Interfaces Inc ***
    ************ INN-Reach MENU *********************

E > EXPORT INN-Reach Circulation Transactions

L > Print INN-Reach paging slips

A > Print INN-Reach paging slips for Pickup ANYWHERE

O > Send a group of records to MeL

M > Send a group of records to MeL as Master Owner

R > Rescind master ownership of records

T > Restart INN-Reach Processes


Q > QUIT

Choose one (E,L,A,O,M,R,T,Q)
```



```
                    Export INN-Reach Circulation Transactions
Choosing the 'T' menu option when no transactions are selected
will automatically select all transactions in the list.
 01 > 100                                28 > 701
 02 > 101                                29 > 704
 03 > 102                                30 > 708
 04 > 103                                31 > 709
 05 > 104                                32 > 740
 06 > 106                                33 > 741
 07 > 108                                34 > 748
 08 > 109                                35 > 801
 09 > 111                                36 > 802
 10 > 121                                37 > 803
 11 > 181                                38 > 804
 12 > 200                                39 > 808
 13 > 201                                40 > 810
 14 > 202                                41 > 901
 15 > 203                                42 > 902
 16 > 204                                43 > 903
 17 > 205                                44 > 904
 18 > 208                                45 > 905
 19 > 209                                46 > 908
 20 > 240
 21 > 241
 22 > 248
 23 > 300
 24 > 301
 25 > 400
 26 > 401
 27 > 502

Select transactions to export:
T > TRANSFER Circ Transactions to PC
Q > QUIT
Choose one (1-46,T,Q)
```


It's All Fun and Games…

Getting and Keeping the Files

- The transaction files are on the INN-Reach server and accessible through the text-based system
- Determining the following could take some time:
  - Who can access the files on the server?
  - Will the files be pulled on a regular basis?
  - Where will the files be stored?

(Very) Large Files

- Multiple transactions are recorded for each request

Year	Number of Transactions (OhioLINK)
2000	1,163,385
2005	1,595,536
2010	2,659,690

- Annual data quickly becomes problematic
  - Too many lines (Excel), or
  - Too big to process (OpenRefine)

Granularity

- INN-Reach sites all have different central codes (and you can only work with what you have)

Itype Code	Meaning
200	Book
201	Sound Recording
202	Video Recording
203	Audio-Visual (not otherwise specified)
204	Library for the Blind materials
205	Kit
206	Map
207	Microform
208	Periodical
209	Realia
210	Software
211	Assistive Device
212	Video Recording (Short Loan)
213	Audio-Visual (not otherwise specified; Short Loan)
214	Sound Recording (Short Loan)
239	Not Otherwise Specified

OhioLINK Book	**200**
OhioLINK Curriculum Center	201
OhioLINK Periodicals	202
OhioLINK Sound Recording	203
OhioLINK Computer Software	204
OhioLINK Audio-visual	205
OhioLINK Microform	206
OhioLINK Non-circ	207
OhioLINK Circulating Media	**208**
OhioLINK Circulating Microform	**209**
OhioLINK Circulating Periodical	**212**

Changes in Data Over Time

- Though all the data is from a single INN-Reach system, there are still inconsistencies introduced over time:
  - Differences between older and current data
  - Differences in record information as the record owner changes
  - Introduction of new:
    - ITYPEs and PTYPEs
    - Participating libraries
    - Loan rules
    - Local policy

Accepting the Acceptable

- There will always be some cases where analysis is more difficult than others:
  - Transactions that are split across timeframes
  - Transactions that followed an unusual pattern
  - Comparison of data across long time spans
- It's important to set a realistic error tolerance based on how much time is available for analysis

Questions?

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