WHY NOT LET THE DATA DO THE DRIVING?

	Column 1	Column 2
Row 1	Row 1, Column 1	Row 1, Column 2
Row 2	Row 2, Column 1	Row 2, Column 2
Row 3	Row 3, Column 1	Row 3, Column 2

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Greetings

- Hi, I'm Mike. I'm a GIS Guy.
- I spend > 80% of my time working with data.
- I spend far less of my time programming.
- I sense that I'm not alone.

How we relate to data vs. programming

- **Most** of us are comfortable working with data
- Only some of us are comfortable programming

Which will live longer?

- Your applications?
- Your data?

- Hint: data is the foundation & apps are the house.
- Another hint: houses eventually get torn down

What has changed more in the past decade?

- Data or Applications
- Which do you expect to change more in the future?
  - I'm betting on applications

Where is stability?

- It's the Data, stupid.
  (don't take that personally)
  - Databases change, but it's all still rows & columns

	Column 1	Column 2
Row 1	Row 1, Column 1	Row 1, Column 2
Row 2	Row 2, Column 1	Row 2, Column 2
Row 3	Row 3, Column 1	Row 3, Column 2

- Application development skills are as important as ever, but it is just a much more dynamic skill set.

Data Driven Apps

- Store the app configuration & logic as data
  - In a database or in XML files
- Embrace them & empower your data management skills!

The case for data-driven apps

- Have you ever had to keep a legacy application working that had it's entire configuration bound up in the code?

```
#include <math.h>
#include <sys/time.h>
#include <X11/Xlib.h>
#include <X11/keysym.h>
double L ,o ,P
,_=dt,T,Z,D=1,d,
s[999],E,h= 8,I,
J,K,w[999],M,m,O
,n[999],j=33e-3,i=
1E3,r,t, u,v ,W,S=
74.5,l=221,X=7.26,
a,B,A=32.2,c, F,H;
int N,q, C, y,p,U;
Window z; char f[52]
; GC k; main(){ Display*e=
XOpenDisplay( 0); z=RootWindow(e,0); for (XSetForeground(e,k=XCreateGC (e,z,0,0),BlackPixel(e,0))
; scanf("%lf%lf%lf",y +n,w+y, y+s)+1; y ++); XSelectInput(e,z= XCreateSimpleWindow(e,z,0,0,400,400,
0,0,WhitePixel(e,0) ),KeyPressMask); for(XMapWindow(e,z); ; T=sin(O)){ struct timeval G={ 0,dt*1e6}
; K= cos(j); N=1e4; M+= H*_; Z=D*K; F+=_*P; r=E*K; W=cos( O); m=K*W; H=K*T; O+=D*_*F/ K+d/K*E*_; B=
sin(j); a=B*T*D-E*W; XClearWindow(e,z); t=T*E+ D*B*W; j+=d*_*D-_*F*E; P=W*E*B-T*D; for (o+=(I=D*W+E
*T*B,E*d/K *B+v+B/K*F*D)*_; p<y; ){ T=p[s]+i; E=c-p[w]; D=n[p]-L; K=D*m-B*T-H*E; if(p [n]+w[ p]+p[s
]== 0|K <fabs(W=T*r-I*E +D*P) |fabs(D=t *D+Z *T-a *E)> K)N=1e4; else{ q=W/K *4E2+2e2; C= 2E2+4e2/ K
*D; N-1E4&& XDrawLine(e ,z,k,N ,U,q,C); N=q; U=C; } ++p; } L+=_* (X*t +P*M+m*l); T=X*X+ l*l+M *M;
XDrawString(e,z,k ,20,380,f,17); D=v/l*15; i+=(B *l-M*r -X*Z)*_; for(; XPending(e); u *=CS!=N){
XEvent z; XNextEvent(e ,&z);
++*((N=XLookupKeysym
(&z.xkey,0))-IT?
N-LT? UP-N?& E:&
J:& u: &h); --*(
DN -N? N-DT ?N==
RT?&u: & W:&h:&J
); } m=15*F/l;
c+=(I=M/ l,l*H
+I*M+a*X)*_; H
=A*r+v*X-F*l+(
E=.1+X*4.9/l,t
=T*m/32-I*T/24
)/S; K=F*M+(
h* 1e4/l-(T+
E*5*T*E)/3e2
)/S-X*d-B*A;
a=2.63 /l*d;
X+=( d*l-T/S
*(.19*E +a
*.64+J/1e3
)-M* v +A*
Z)*_; l +=
K *_; W=d;
sprintf(f,
"%5d  %3d"
"%7d",p =l
/1.7,(C=9E3+
O*57.3)%0550,(int)i); d+=T*(.45-14/l*
X-a*130-J* .14)*_/125e2+F*_*v; P=(T*(47
*I-m* 52+E*94 *D-t*.38+u*.21*E) /1e2+W*
179*v)/2312; select(p=0,0,0,0,&G); v-=(
W*F-T*(.63*m-I*.086+m*E*19-D*25-.11*u
)/107e2)*_; D=cos(o); E=sin(o); } }
```

*Example: 1998 International Obfuscated C Code Contest Winner Flight Simulator code

Which ones are data driven?

- Google
- Facebook
- Twitter
- Ebay
- Amazon.com

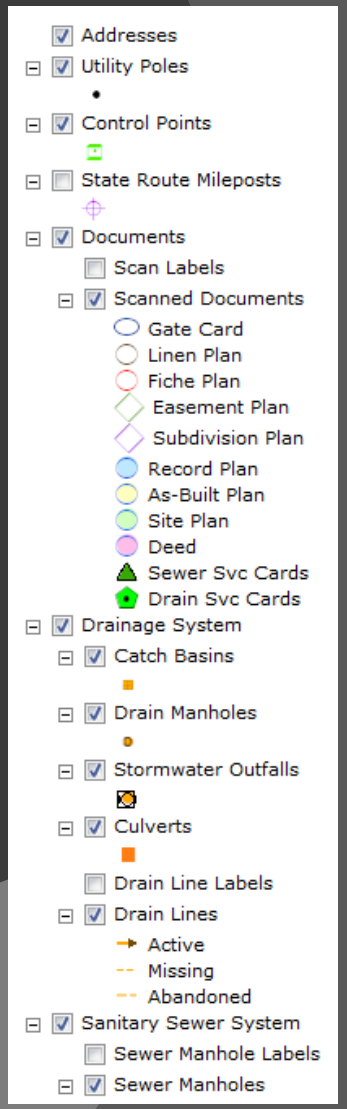
- **THEY ALL ARE**

Case Study: Amherst GIS Viewer

- Staff time invested primarily on the database side
- One evolving data schema for past 5 years
  - SQL Server 2000 > SQL Server 2008
  - ArcIMS 9.1 > ArcGIS Server 9.3.1
- General Purpose Viewer App developed & evolved by consulting firm AppGeo for a consortium of organizations

Amherst GIS Example: Map Legend

MapTabID	LayerID	ShowInLegend	CheckInLegend
UtilityBaseMap	Addresses	1	1
UtilityBaseMap	Aerial1974	1	0
UtilityBaseMap	Bridges	1	1
UtilityBaseMap	Buildings	0	0
UtilityBaseMap	CatchBasins	1	1
UtilityBaseMap	Contours	1	0
UtilityBaseMap	ControlPts	1	1
UtilityBaseMap	Culverts	1	1
UtilityBaseMap	DrainLineLabels	1	0
UtilityBaseMap	DrainLines	1	1
UtilityBaseMap	DrainManholes	1	1
UtilityBaseMap	Driveways	1	1
UtilityBaseMap	Easements	1	1
UtilityBaseMap	ElevationModel	1	0
UtilityBaseMap	Elevations	1	0
UtilityBaseMap	FireHydrant	1	1
UtilityBaseMap	Hillshading	1	0



Amherst GIS Example: Relational Data

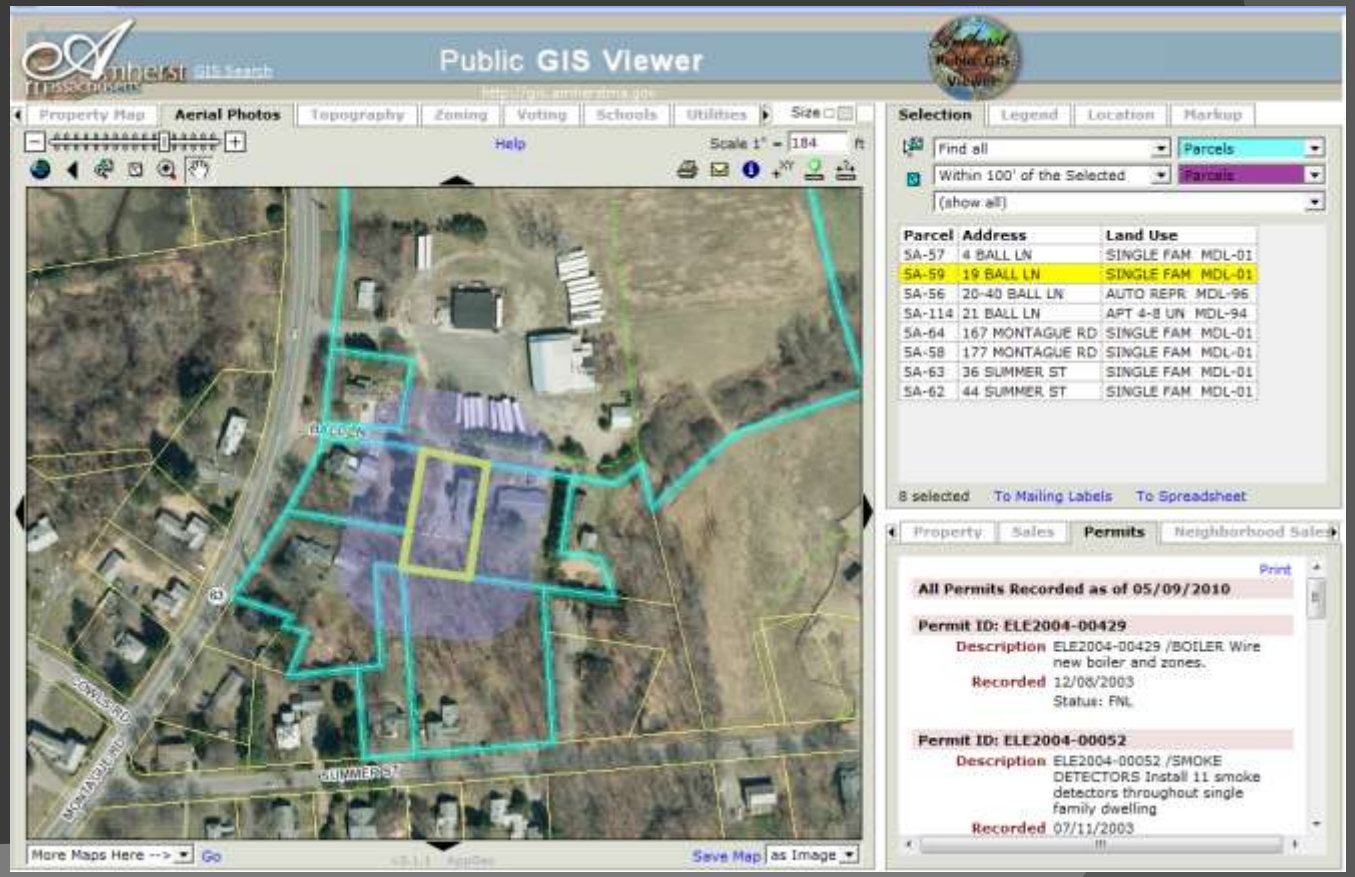
Selecting Parcels triggers Select statements rather than obscure code

```
select          a.PIN as DataID, a.MapParID as MapID,
                a.Street as ZoneId, a.PIN as Parcel,
                a.Location as Address, a.Landuse as [Land Use]

 from TOA_CAMA_TABLE a
 inner join     iter_charlist_to_table(@gpinlist, DEFAULT) b
                                on a.MapParID = b.nstr

                where a.LANDUSE != 'CONDO MAIN'
                order by a.Street, a.Number_, a.MapParId, a.PIN
```

```
@parcelid nvarchar(26)
as
SELECT DISTINCT
a.AlternateParcelId + ' / '+ a.Location as Header,
a.PIN as Parcel,
dbo.FormatCurrency(a.TotalAssessment) as Assessment,
a.LandUse as Landuse,
…
....
```

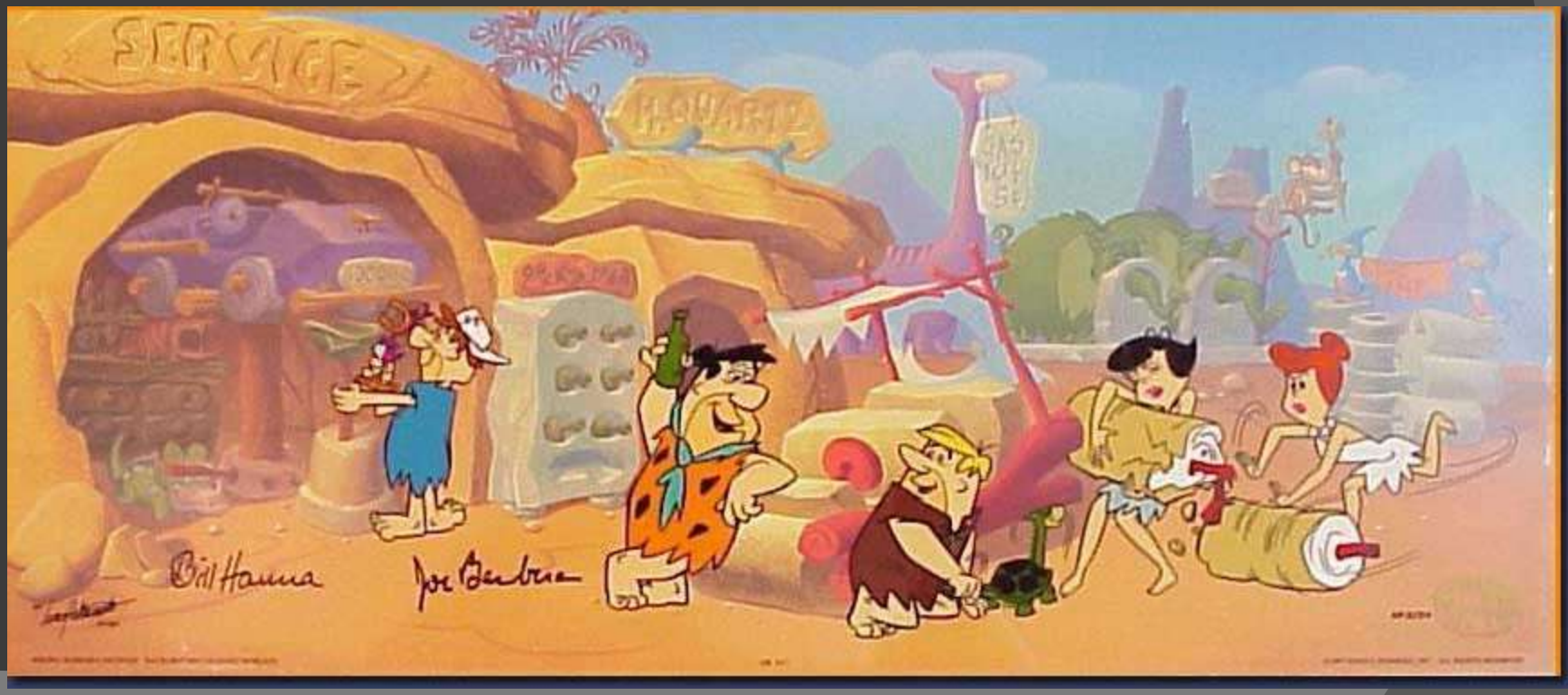
Time to refactor the app?

- User interface looks very 2005…
- …but what makes it work is a database schema that will support any technology



New apps coming…

- We're not reinventing the wheel…
- …we're just changing tires.



THANK YOU!

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