



CPSeis – an Open-Source

Case History

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Outline



- Get Permission
- Understand ROI
- What is your End Game?
- Pick a Target Platform
- Issues
 - Compiler changes
 - Fixing legacy code

PERMISSION



- Research licenses for open source, make sure they are business-friendly. <http://opensource.org> MIT license
- I picked MIT because it is small (2 paragraphs)
- LEGAL
 - The legal team always wants to add their changes
 - DON'T LET THEM! Help them understand why the license needs to be left alone. Help them see the benefits.
 - Take your lawyer to lunch



6/11/11 Make sure the company is ready to shed itself of this IP

Return On Investment



- **MANAGEMENT** must see value in open-source
- ROI takes on many forms for a company
 - WILL THEY STILL USE THE SOFTWARE?
 - Then ROI includes more users hitting it and finding bugs, helping with changes
 - ROI includes allowing others to work with your internal programming team
 - HAVE THEY ABANDONED THE SOFTWARE?
 - ROI includes "Good Will" among the community

END GAME



- What do you hope to accomplish?
- For CPSeis, my goal was:
 - Provide a system for undergraduate and graduate study of seismic processing
 - Provide a means for others to mine the software for algorithms
- Results to date:
 - OpenGeophysical built a product around it (OpenCPS)
 - Fusion added wrappers to the modules for their product (GeoPRO)
 - Several others have the software internally

Target Platform



This is difficult for a complete system

- Match up a good MPI
- A good Queuing system
- A good compiler (or set of compilers)
- An Operating system
- A package manager
- Third-party dependencies
- A Graphics suite/engine

Target Platform



- Click to edit the outline text format
 - Second Outline Level
 - Third Outline Level
 - Fourth Outline Level
 - Fifth Outline Level
 - Sixth Outline Level

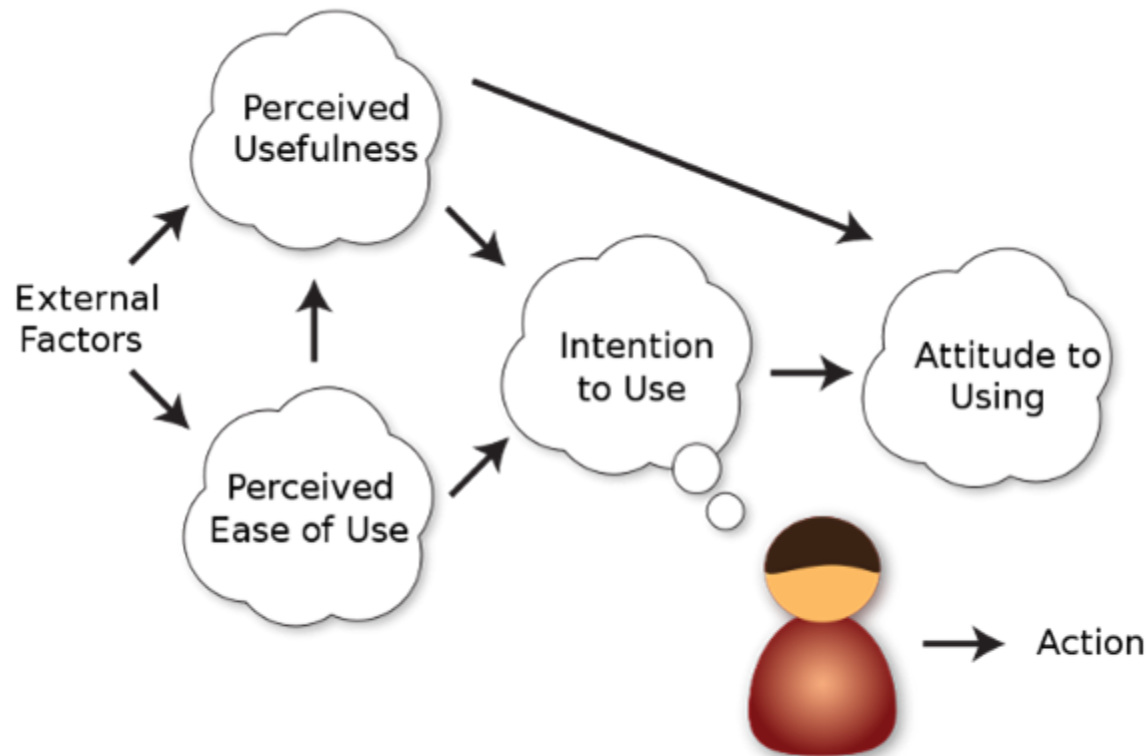
- **Outline text format**
- **Second Outline text format**
- **Third Outline Level**
 - Second Outline Level
 - Third Outline Level
- **Fourth Outline Level**
 - **Fifth Outline Level**
 - Sixth Outline Level
- **Sixth Outline Level**

Issues



- Getting "market share"
- Compiler Changes
- Fixing legacy code
- Packaging
- Helping users

Decisionmaker Thinking (obtaining market share)



Technology Acceptance Model (TAM)

Compiler Changes and Legacy Code



- “Hard” compilers (F9x, C++)
 - GNU C++ is more strict than it used to be
 - So... legacy C++ sometimes decides to not compile
 - The work may be overwhelming... so
- Modify the Software OR
- Repackage with other Open Source components!

EXAMPLE:

**Weinman
GeoScience**

6/11/11

GeoScience, (Viewer and Velocity Analysis)

if you can't fix it, replace it with GNU compiler and

Fixing Legacy Code



- Fortran usually not a problem (F90 F95, that is)
- F77 code is full of old errors, hard to find
- C++ (for me at least) is a nightmare
- gdb is your friend
- (and so is "print")
- But... Get the code to work. Put it into a structure
- Take out as many dependencies on the old environment as you can

Packaging



- Put the code together in some kind of structure that will allow for changes
 - Because you WILL be putting in the changes – no one else will!
- When you get ready, put the source into SVN
 - Sourceforge is a good repository
 - Eclipse can be used with subclipse for end users to keep code current and to checkout/in changes
- Keep working on your makefiles and build scripts

Helping Users



- If you don't have time to do the above steps...
- Then you'll spend more time here.

- Do what you can
- Enlist others
- Try to form a support group

Screen Shots - cfe



Open Source Version

File Edit View Options Tools Help

UTILS DOC VWF VJF VRF XPBS CBYT VA JOBMON HDRS LIST

Working Environment = bmenger@NONE/home/bmenger/

Workfile Builder Multi-Workfile Builder Submit Job Session Log

System Defaults

Process Screen Copy All Append Delete Replace Insert After Insert Blank Clear Selections Undo Clear Workfile Clear Old Buffer ICPS (local) ICPS (remote) Build Job Submit Job

Select Old Workfile...

Select Current Workfile...
spike_7.wrk

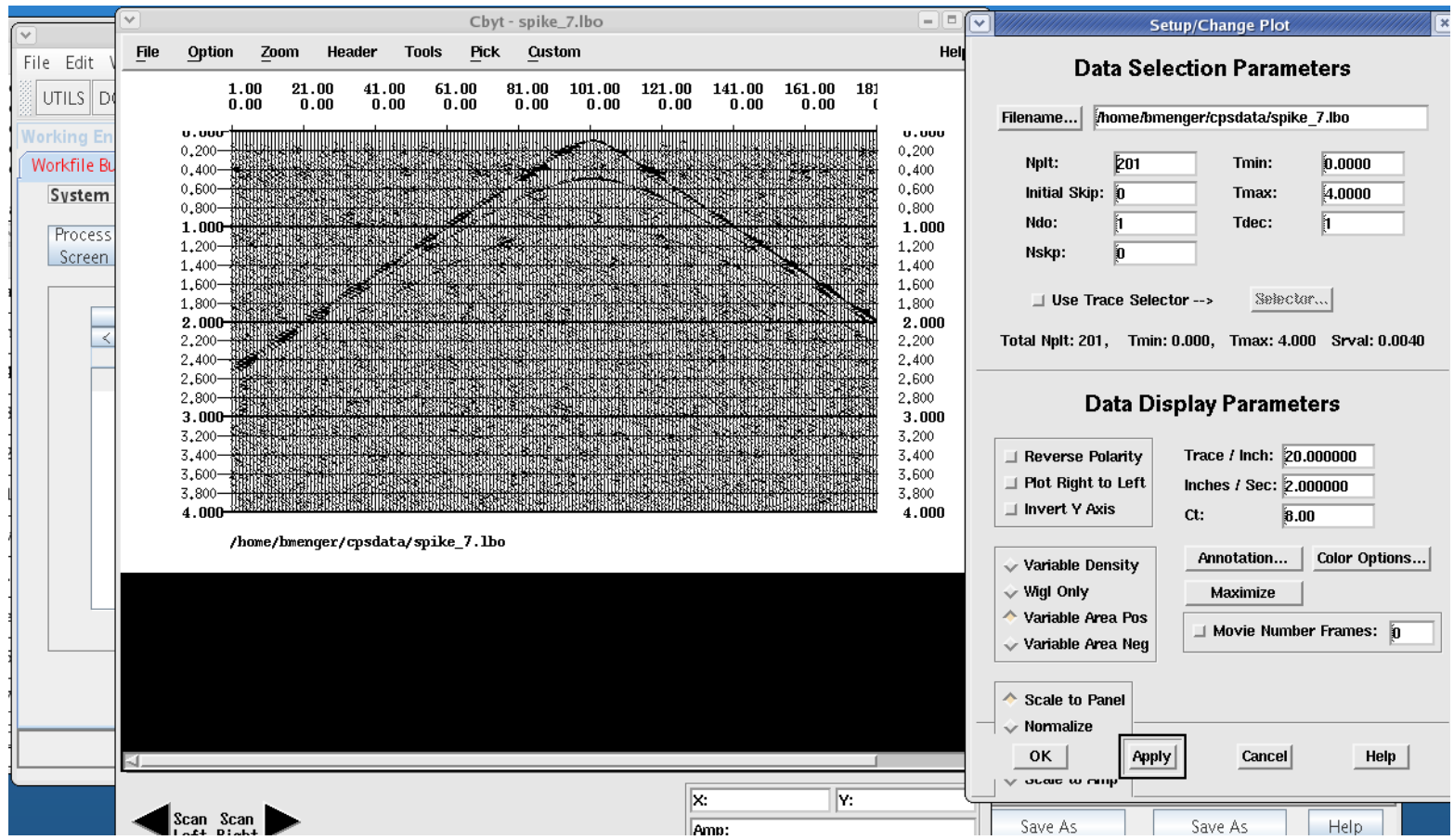
CPS Processes
All_Processes

Process
1 ABAL
2 ABRA
3 ACORR
4 ADNS
5 ADPSUB
6 ALAMO
7 AMPDG
8 APIN
9 ATRIN
10 ATROT
11 AVAGRAD

List of processes in the current workfile.

OK Apply Cancel Reset << 8 TROT >> Save As Project Default Save As User Default Help

Screen Shots - cbyt

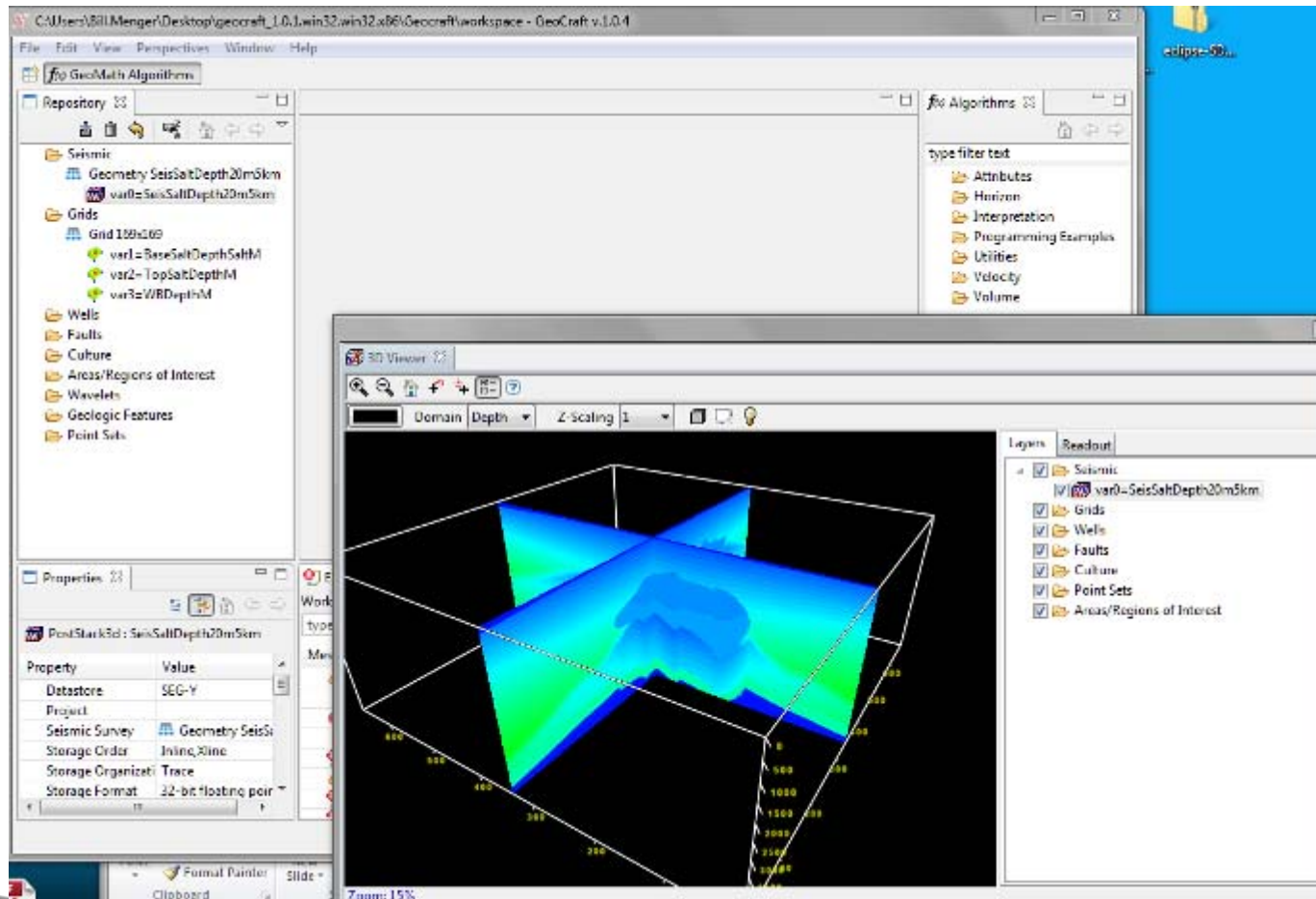


GeoCraft

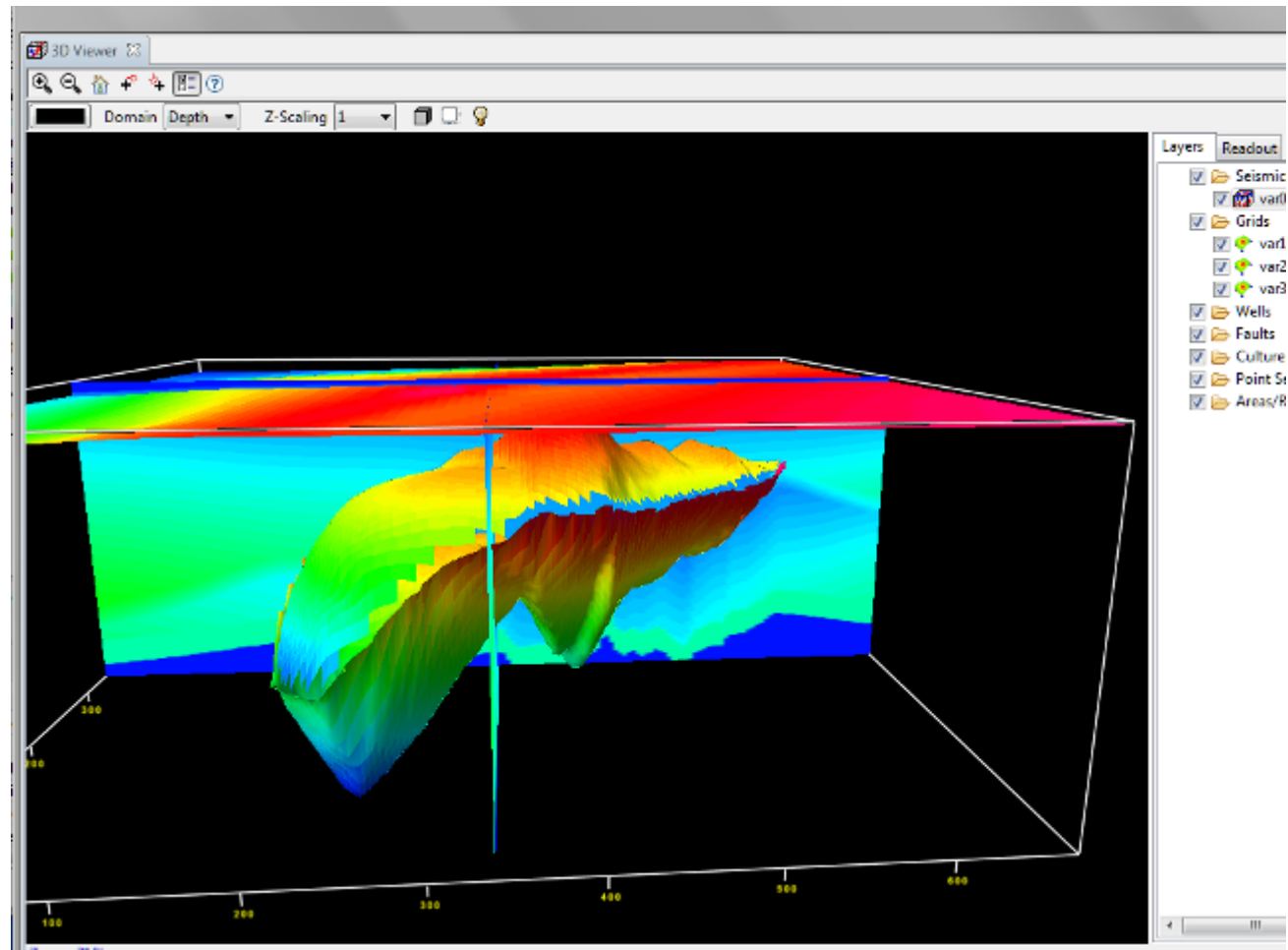


- Pure Java
- Many Platforms
- Interpretation
- AVO analysis
- Model Building
- Viewing
 - LAS

GeoCraft – SEG Salt Model



GeoCraft – SEG Salt Model



REFERENCES



- <http://cpseis.org>
- <http://sourceforge.net/projects/cpseis>
- <http://geocraft.org>
- <http://code.google.com/p/geocraft/downloads/list>
- <http://opensource.org/licenses/MIT>

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