Effective Knowledge Transfer in a Rapidly-Developing Play: New "Learnings" or "Findings" Reports*

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Abstract

Petroleum exploration and development requires transfer of knowledge, the analysis of recent findings, and the interdisciplinary discussion of so-called "learnings." However, organizations are often ill-equipped to effect the knowledge transfer because the discursive forms available to them – reports, memos, presentations, posts, social media – are often inadequate vehicles. The current forms and processes do not incorporate the same objectives, and, in Lloyd Bitzer's words, the "rhetorical situation" is completely different.

For that reason, it is very important to develop a format that can be easily incorporated and deployed across the organization; this helps maintain focus and creates a structure that encourages the clear identification and development of classification (and retrieval) cognitive schemes and categories. At the same time, it encourages crossing discipline lines and framing a problem in terms of prior knowledge, personal experience, and knowledge gleaned from sources and ways of thinking outside one's immediate purview. Consequently, the resulting template is eminently collaborative and solution-centered, and easily adapted to a number of different occasions, places, uses, needs, and stakeholders.

This presentation provides an overview and framework of a template, along with theoretical underpinnings that explains how and why it is effective as a knowledge transfer and learning tool. It also presents an example of the template in use and suggests how / where it can be modified in practical application.
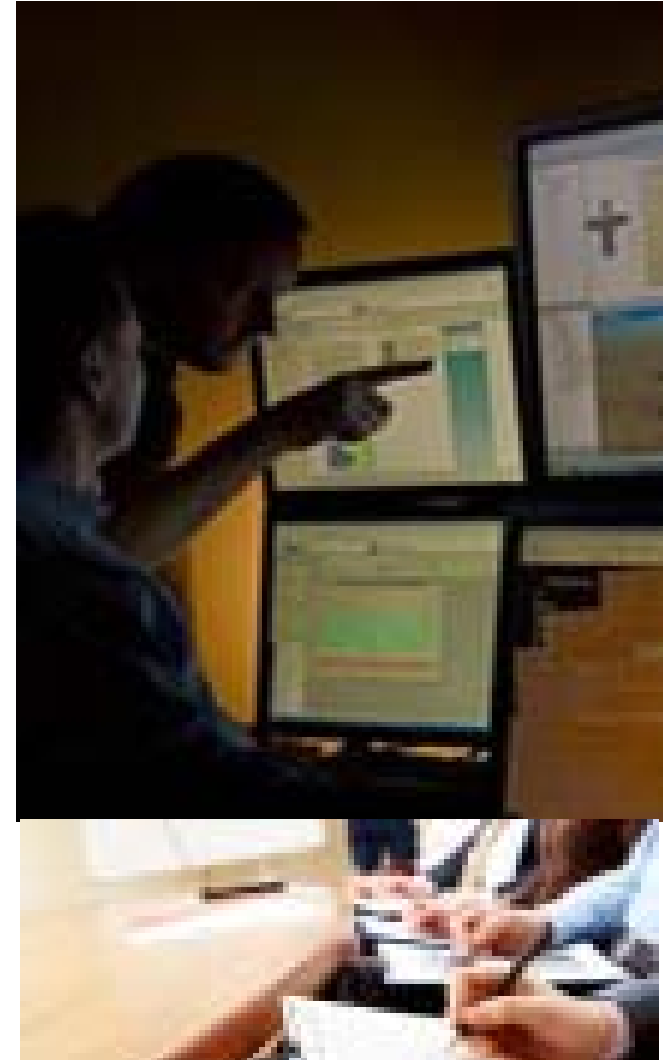
Effective Knowledge Transfer in a Rapidly-Developing Play:
New "Learnings" or "Findings" Reports

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Goal

- Create a vehicle for the transfer of knowledge that encourages the sharing of information
  - Teams
  - Across organizations
  - Across disciplines
  - In communities of interest
- "Learnings"
  - Findings
  - Lessons learned
  - New knowledge

Need for "Learnings" Report Structure

- Situation today:
- Inconsistent approach to knowledge transfer, with the following problems:

    - Too general: missing data, background, implications for future
    - Too detailed: information obscured in fog of data

- Solution: New Report Structure
- "Learnings" Template

Why Does this Approach Work?

How People Learn

▸ Constructivist
  ▸ Problem-based
  ▸ Learning as experience
  ▸ Vygotsky's Zone of Proximal Development
  ▸ Cognitive apprenticeship (scaffolding)

▸ Cognitivism
  ▸ Schema / Schemata-building
  ▸ Information organization / mental models / knowledge maps

▸ Behaviorist
  ▸ Social learning (through observation, imitation, modeling)

Elements in the "Learnings" Template

> Solution: Standardize presentation of "lessons learned" / template

> > Conclusions and implications for the future
> > Background of need / problem
> > Specific lessons learned (connect to case)
> > Implications for the future

Standardize

Implications

Lessons Learned

Future

Conclusions

State Need

Section 1: Conclusions of Findings / Learnings

- Engage your audience

- "Why" -- how is it important

- How can the findings apply to something

Engage

Rationalize

How

Why Important

Application

Findings

Section 2: Need or problem addressed

- What problem or need is being addressed? Where?

- How was the need addressed in the past?

- Who did the work?

- Did you do a lit review?

- What were the top two or three thinkers / papers?

- Where was work done?

Need

> **Problem addressed**

How addressed?

> **Work? Lit Review?**

Top thinkers?

> **Where work done?**

Section 3: Specific Lessons Learned

- What were the key findings?

  Findings

- Evidenciary support

  Evidence

- Describe data collected

  Data collected

- Summarize the results of data analysis

  Data Lab Results

- What makes you sure of your results?
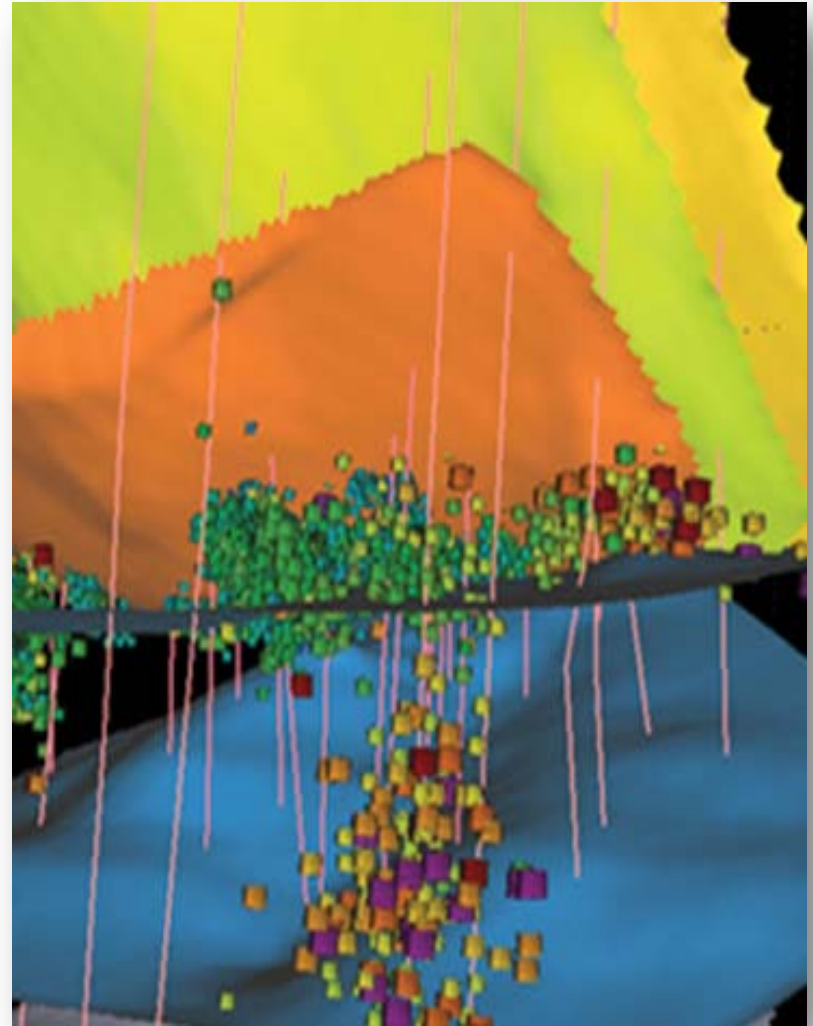
  Why sure?

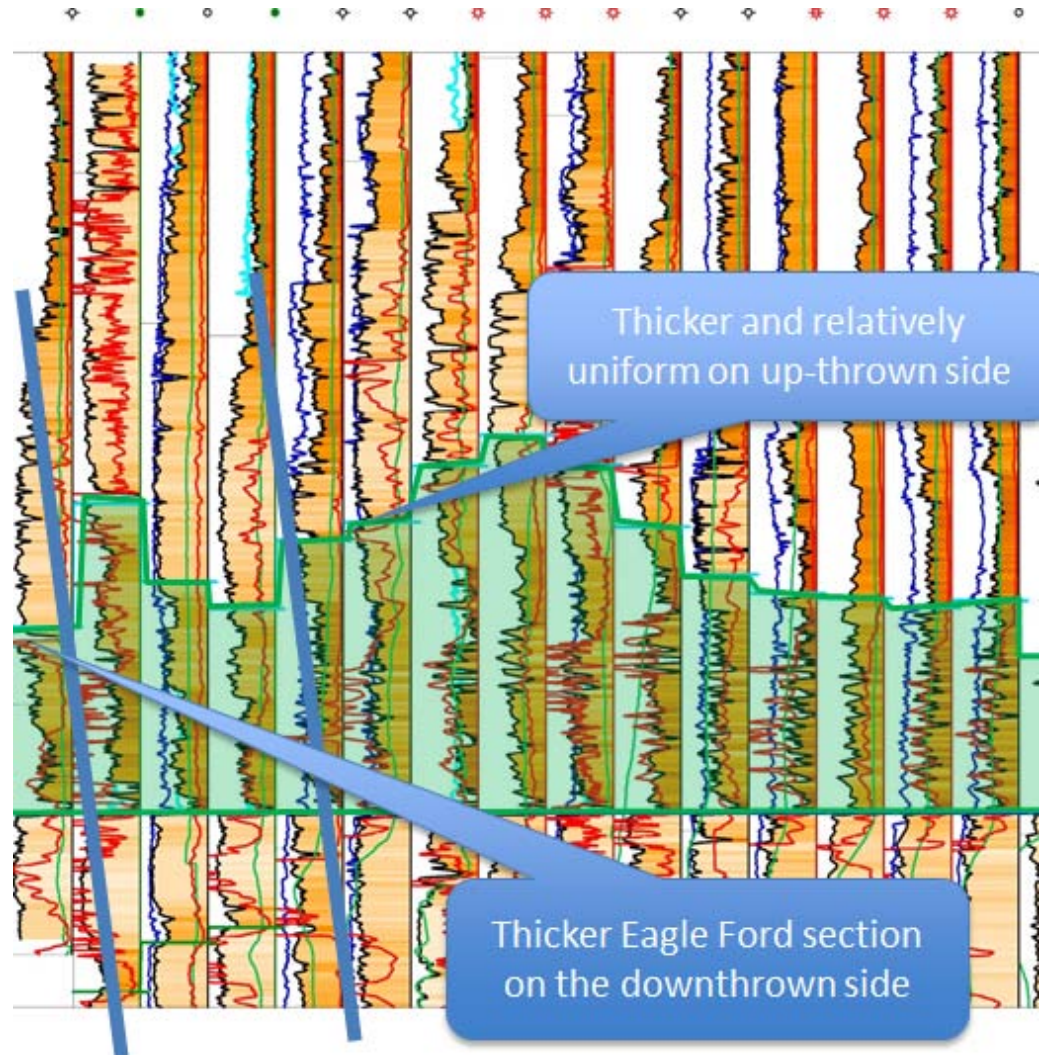-

- Additional related evidence?

  Related material

Section 4: Implications for the Future

- Application of the lessons learned / findings

- Economic implications

- Technological implications

- Potential unintended consequences?

- Costs? Benefits?

EXAMPLE: A Guide for You to Follow

▸ Case Study of Shale Wells in New Play:

▸ First Wells Indicate Path to Increased Recoveries

Thicker and relatively uniform on up-thrown side

Thicker Eagle Ford section on the downthrown side

Section 1: Conclusions & Implications

- "Learnings" (New Knowledge and Insight)
  - Case Study of Drilling, Completions and Stimulation: Problems Yield Insights
  - New Geological Information Shows Reserves Are There
  - Learnings Give Clues How to Complete Effectively
  - Fracture Networks, High TOC, Porosity / Permeability Pods / Sweet Spots
  - Lithology Information Demonstrates Potential Recoverability
- Implications for the Future

Learnings

case study

Geological information

fractures

completions

permeability

sweet spots

lithology

implications

Section 2: Need Addressed

- How to optimize operations to effectively and consistently produce from a new shale play
- Background (Before)
- In the early 80s, wells completed in this zone showed potential for commercial production
- Analogues seem promising
- Drilling, completion, and stimulation techniques used in other shale plays not applicable
- The information about the formation was insufficient and overly general

Section 3: Specific Lessons Learned

▸ Type of drilling

▸ Type of logging

▸ Type of completions

▸ Type of fracs

▸ Type of production

Optimized well placement

LNN

smart 4D drilling

Logging while drilling

NMR

cased hole

production logs

microseismics

fracture networks

data acquisition modules

▸

Section 4: Additional Insights / Implications

- Fracture networks / micro-fractures
- Grains and pore geometry matters
- Geomechanics: how ductile or brittle? how to best frac and prop?
- The nature of nano-networks and conduits means using …
- Shale mineralogy and behaviors with reservoir fluids means ..
- Estimated Ultimate Recoverable Reserves for future wells in the new shale sweet spots in this area could yield (for example) 100,000 bbls / well
    - a
    - b
    - c
    - d

Let your learnings tell a story:

▸ We got into a new shale play, and nothing was known about the formation except for old data and information because wells since the 1920s had drilled through it, but had considered it uneconomic and/or unproducible.

▸ Thanks to new technology, we decided to try the new play

▸ We have drilled 5 wells, and have conducted many tests:

  ▸ *Here are our results.*

"Learnings" should point to the future

- Conclusions forward-facing

- Example:
  - Although each well turned out to be disappointing, each for different reasons, we learned a great deal about the formation, the play, and specifically

    - how to identify sweet spots
    - what drilling fluids to use
    - best way to complete the well and the kinds of logs needed
    - best way to stimulate the well
    - how best to produce the well

Formalizing "Learnings" Reports to Maximize Knowledge Transfer in Your Company

▸ To effectively communicate "learnings" across an organization or community of interest, it is often useful to develop a template or "learnings design document."

▸ Unfortunately, most technical writing texts do not yet address that specific need.

http://youtu.be/9TFJA4UnYPQ

Templates for "Learnings"

▸ Here is a proposal for a Learnings Template or Learnings Design Document, and a brief introduction to the kinds of information that can be included in it.

Video:
http://youtu.be/AzNSRV7Sy_w