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Report Abstract

Reflecting Complexity & Impact of Laws On a USDA Forest Service Project

November 2001

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Preface

This abstract is the formal representation of the first eight pages of an initial draft report discussing the complexity of laws in the USDA Forest Service Project Planning process and the accompanying power point presentation that provided additional detail behind summarized report finding. These initial report findings were based on a 6-week business modeling effort using the BusinessGenetics proprietary methodology, which included their eXtended Business Modeling Language℠ (xBML℠) and a unique facilitation approach called Business Co-formulation℠ (BCF℠). The discussion herein is based on an analysis conducted by both BusinessGenetics and the USDA Forest Service project participants of the resulting draft business models. These draft business models are available upon request to the USDA Inventory and Monitoring Institute. This document reflects updates to the initial report content based on feedback received during briefings in Washington DC, October 2001.

Executive Summary

Project Purpose

The purpose of this project was to aid the Chief of the USDA Forest Service in his discussions on the complexity of laws applicable to the Forest Service by graphically articulating the interaction and impact of these laws on forest level project planning through the use of industry accepted business process modeling and analysis methodologies. In support of this purpose, BusinessGenetics, the USDA Forest Service Inventory and Monitoring Institute and the USDA Pike and San Isabel National Forest, South Platte Ranger District Office developed / validated selected business and process workflow models that show the activities necessary to conduct **project planning** and comply with NEPA (National Environmental Policy Act) and other laws within the context of a timber sale. These models were developed using existing USDA Forest Service documentation and USDA Forest Service Personnel (from the Inventory & Monitoring Institute and South Platte Ranger District Office) as Subject Matter Experts (SMEs). The South Platte Ranger District Office SMEs then validated the resulting models within the context of their Upper South Platte Watershed Protection & Restoration Project. As a result of this modeling effort, BusinessGenetics and the Inventory & Monitoring Institute were able to document several preliminary findings and future options through the analysis of the models.

Summary of Preliminary Findings

1. The business/workflow models indicate considerable impacts in terms of time and costs during the planning phase of a project, with a significant number of those impacts reflected in the environmental analysis phase.
2. The business/workflow models highlight the considerable complexity caused by the exponential interactions among the laws that govern environmental analysis within project planning.
3. The business/workflow models indicate the potential for interruptions in the project analysis/decision making process by other State and Federal agencies with environmental regulatory authority.
4. The business/workflow models indicate the need for intricate synchronization of the independent processes called for by each of the governing environmental laws, which causes additional complexity in the implementation of these laws within the project planning process.

Points 2 –4 above notably contribute to process inefficiency that directly translates to significantly increased effort (time & cost - point 1). A complete set of the preliminary findings can be found in the report.

Future Options

As a result of the analysis, the Forest Service and BusinessGenetics team identified the following future options for consideration:

1. Complete the business process modeling effort.
2. Review / Revise the Directives System.
3. Use formal business modeling approach to proactively support development / maintenance of legislation and directives.
4. Further analyze the need for a two-step decision-making process with multiple associated NEPA analyses (in both the forest planning and the project planning efforts).
5. Use information technology to support the definition, compliance and implementation of laws.

Project Description

Project Overview

In August 2001, BusinessGenetics and the USDA Forest Service Inventory and Monitoring Institute (IMI) were asked to develop a business model to graphically articulate the activities associated with project planning. To accomplish this task, BusinessGenetics was asked to develop business models that showed the activities and workflows for the compliance of laws that govern project planning. Over the next 6 weeks, BusinessGenetics worked with Subject Matter Experts (SMEs) from IMI and the USDA Forest Service Pike and San Isabel National Forest, South Platte Ranger District to produce a set of selected business models that defined this task. To accomplish this, the activities and workflows required by the governing laws were modeled using existing USDA Forest Service documentation and experienced USDA Forest Service Personnel and then validated within the context of a timber sale within the Upper South Platte Watershed Protection & Restoration Project.

As a result of the modeling effort, BusinessGenetics, IMI and the South Platte Ranger District Office were able to extrapolate several preliminary findings and considerations through the analysis of the models. The laws / rules / regulations / policies that were considered during the modeling process included:

1) National Environmental Policy Act (NEPA),
2) National Forest Management Act (NFMA),
3) Endangered Species Act (ESA),
4) Clean Water Act (CWA), 5) the Clean Air Act (CAA),
5) National Historic Preservation Act (NHPA),
6) Roads Rule,
7) Timber Sale Preparation Handbook.

Please refer to the *References* section of this report to identify model activities specifically driven out from source documentation versus activities identified based on subject matter expertise.

In October 2001, the results of this project were submitted to the Chief of the USDA Forest Service for his consideration in evaluating the complexity of laws as they relate to project planning.

Project Team

The project team was made up of individuals from BusinessGenetics (consultant / facilitator), USDA Forest Service Inventory & Monitoring Institute (Subject Matter Experts / facilitator), and USDA Pike and San Isabel National Forest, South Platte Ranger District (Subject Matter Experts). The experience of the USDA Forest Service individuals can be found in Appendix A and the experience for the BusinessGenetics' individuals can be found in Appendix B.

Project Context

1. The Business Process models document a limited representation of a single example for Land Management project planning activities. The models include activities necessary to be compliant with the NEPA process and the other major laws affecting project planning.

    a. The models are represented within the context of planning for the Pike and San Isabel National Forest, Upper South Platte Watershed Protection & Restoration Project.
    b. In the context of the bundle of projects for watershed protection & restoration, a timber sale was chosen as a project example to characterize the composite activities and their interactions of laws that govern the USDA Forest Service project management work.
    c. Using the available USDA Forest Service written direction, the timber sale was characterized through Gate 2 of the total 6 Gate process (through environmental analysis & project decision steps).
    d. Activities represented in Gates 1 & 2 of timber sale project planning are a subset of the full suite of activities required by the Timber Sale Project Handbook.

2. The model content was created from written direction contained in USDA Forest Service Handbooks combined with the knowledge and Forest level project planning experience of USDA Forest Service Subject Matter Experts' (SMEs).

3. The models effectively illustrate the interaction of laws associated with environmental analysis and timber sale project planning & design (NEPA, NFMA, ESA, CWA, CAA, NHPA).

4. Most USDA Forest Service land management projects would need to follow a similar suite of activities to comply with the laws that are represented in the model.
    a. The laws listed above represent a subset of all the laws that govern USDA Forest Service Project planning however the listed laws represent all of the major laws that were applicable to the Timber Sale project example.
    b. It was recognized that other USDA Forest Service projects would interact with NEPA in different ways, but the overall NEPA process is well represented by the Timber Sale Project in this example.
    c. It was also recognized that other USDA Forest Service projects may invoke other laws.

5. The timber sale and NEPA process were modeled at a finer level of detail than the other laws (NFMA, ESA, CWA, CAA & NHPA) and the Roads Rule.

Project Background

1. Where possible, the initial model was created from existing USDA Forest Service handbooks. The SMEs have added (and subtracted) activities based on their personal knowledge and experience in the field (additions and subtractions typically represented additional direction from the Regional Office, case law and personal experience). A business process focus was introduced when creating the models.

2. The appeals process was only introduced in the NEPA "How" (workflow) model and while the appeals process represents a significant number of activities, it was not modeled as part of this deliverable.

3. Categorical Exclusions (allowed by the NEPA handbook) have not been modeled because of direction from the Washington Office that project plans should not consider Categorical Exclusions for a Timber Sale.

4. All activities associated with NEPA and other Laws must be considered in any USDA Forest Service project level planning.

Project Conclusions

General Observations

1. The workshop participants all agreed that the intent of the Agency & governing laws is programmatically aligned. However, it was also noted that current implementation to meet compliance to the multiple law requirements has resulted in a complex, often difficult business process.

2. Process interaction between laws is extremely complex. For each additional law that must be considered for any given process, the complexity becomes exponential.

3. Over 800 Planning activities were identified. Although not fully considered within the context of all activities necessary to complete the project example, the BusinessGenetics business analysts feel this represents a strong bias or over emphasis on planning. The question to be explored is one of Return on Investment (ROI) when considered in the context of a given Forest Level Project Objective. It was also noted through discussion with the SME's and recognition of new laws being passed that this emphasis on planning seems to be a steadily increasing trend, again, raising the question of ROI and feasibility of conducting certain types of projects. Significant planning emphasis may unduly impact project implementation.

4. During discussions with the SME's it became apparent that Program Level environmental analysis is often perceived to be of little value at the Project Level. The timing of these two activities is usually out of alignment and the information made available from the Program Level activities is often identified as no longer relevant or applicable, given the timing, scope and scale of a specific Project. What is not apparent or clear is the purpose / objective for conducting an environmental analysis at both a Program and Project level or how these two activities should align, if at all. Currently, conducting the two separate efforts appear at best, redundant, at worst, of minimal value relative to effort.

5. The project planning process is highly susceptible to recursion / interruption & even non-completion. In reviewing the draft workflow models, it was apparent that process challenges are faced given Public involvement and the concepts of "Divided Authorities" with whom the Agency must collaborate or gain approval to proceed. While the necessity and appropriateness of including the public and consulting with other government agencies was recognized, opportunities for better facilitating these required interactions should be explored.

Preliminary Project Findings

Business Process Analysis Findings

1. The business/workflow models indicate considerable impacts in terms of time and costs during the planning phase of a project, with a significant number of those impacts reflected in the environmental analysis phase.

2. The business/workflow models highlight the considerable complexity caused by the exponential interactions among the laws that govern environmental analysis within project planning.

3. The business/workflow models indicate the potential for interruptions in the project analysis/decision making process by other State and Federal agencies with environmental regulatory authority.

4. The business/workflow models indicate the need for intricate synchronization of the independent processes called for by each of the governing environmental laws, which causes additional complexity in the implementation of these laws within the project planning process.

Efficiency / Inefficiency Findings

1. Project Bundling (multiple projects combined in a single environmental analysis effort) provides potential efficiencies in conducting effects analysis and disclosing the results of the effects analysis in an environmental document.

2. Inefficiencies exist in the two-step decision-making process with multiple associated NEPA analyses (in both the forest planning and project planning efforts).

Risk Management Findings

1. Time / effort spent on NEPA activities is dependant on previous experiences with the public and the Decision Maker's comfort level (risk acceptance) with the project area.

2. An intense level of detail (time & effort) has been introduced into the process, due to risk mitigation and burden of proof (as it relates to public comments).

3. Anticipated public comments and scrutiny to the process may result in additional time & effort in analysis.

4. Case law is often over interpreted and inconsistently applied, which can result in additional time & effort being expended.

Handbook Related Findings

1. Handbooks introduce a more comprehensive set of activities than may be required by the law.

2. USDA Forest Service Handbooks may not include all currently required activities.
    a. Many activities represented in the model have come from SME knowledge & experience. New direction from the Washington Office and case law supercede some of the handbook direction.

3. Handbooks are not process guides; they are reference guides.

4. Not all laws have a supporting USDA Forest Service handbook.

Activity Requirements Findings

1. Compliance with NEPA and other laws represents a significant portion of the effort (time and cost) necessary to plan for a timber sale.

2. Interactions of all the applicable laws in a timber sale introduce additional complexity into the timber sale planning process.

3. Roads Analysis is a Forest level activity being called for at the project level (when Roads Analysis has not already been performed on the project area).
    a. The Roads Analysis requires a broader a scope than is necessary at the project level.
    b. The Roads Analysis does not provide meaningful information for a decision maker at the project planning level. It is best suited at the Forest Planning level or landscape scale.

4. Certain activity requirements, at the project level, are dynamic / subjective due to the interpretation of case law & direction from the Washington Office.
    a. Communication of case law requirements / activities is often informal.

5. As a result of not being able to use the Categorical Exclusion option, projects are often either over analyzed (an Environmental Assessment requires a much greater level of analysis than is required by a Categorical Exclusion) or they are not under-taken (the time/cost expense of doing an Environmental Assessment often outweighs the benefits derived by a project and thus the project is not undertaken; this would not necessarily be so if Categorical Exclusions were allowed).

Findings Associated with Linkages and Feedbacks between Laws (System Approach)

1. The linear or sequential approach to considering laws establishes a linear protocol and does not support or adequately describe the feedbacks or interactions needed when considering the complexity of legal requirements.
    a. By not considering the feedbacks or interactions between legal requirements, Forests are more likely to make errors in effects analysis, opening themselves up for additional legal action and expenses.

2. Current linear process is insufficient in characterizing a non-linear process of interactions between the laws.

Findings Associated with Alternatives to the Proposed Action

1. Range / Complexity of Issues drives the number of project plan alternatives (NEPA).
    a. The range of alternatives considered is determined by the Line Officer.
    b. Each additional alternative adds an exponential increase in:
        i. Complexity,
        ii. Time,
        iii. Expense.

Public Involvement Findings

1. The public can choose not to be involved until late in the project planning process.

a. This can result in delays and additional expenses to rework alternatives and the NEPA process.

Future Options and Considerations

1. Complete the business process modeling effort.
    a. Estimate / Analyze the costs associated with project planning.
    b. Conduct additional analysis to identify efficiencies in the current project planning process.
    c. Model several projects to fully characterize the cost / effort information.
    d. Construct a model considering all the feedbacks and linkages between laws and directives for project planning.
    e. Expand the models to include all the dimensions of the xBML™ approach.
    f. Validate all the models with appropriate SMEs.
    g. Involve other agencies, as appropriate, in validation of the models.

2. Review / Revise the Directives System.
    a. Review methods and technologies for real time updates to the directives system.
    b. Review context and use of directives system.

3. Use formal the business modeling approach to proactively support development / maintenance of legislation and directives.
    a. Translate the model (from number 4 above) into draft legislation and directives that includes all of the relevant requirements of the current laws and directives.

4. Evaluate opportunities to improve efficiencies at the project level.
    a. Further analyze the need for two-step decision-making process with multiple associated NEPA analyses (in both the forest planning and project planning efforts).
    b. Re-establish capabilities of the Categorical Exclusions in the Timber Sale process.

5. Use information technology to support the definition, compliance and implementation of laws.

References

Source Documents

"FSH 1909.15 – Environmental Policy and Procedures Handbook (NEPA)", USDA Forest Service, http://www.fs.fed.us/im/directives/fsh/1909.15/, September 3, 1993.

"FSH 2409.18 – Timber Sale Preparation Handbook", USDA Forest Service, http://www.fs.fed.us/im/directives/fsh/2409.18/ , March 5, 1999.

"Endangered Species Consultation Handbook", U.S. Fish & Wildlife Service and National Marine Fisheries Service, http://endangered.fws.gov/consultations/s7hndbk/s7hndbk.htm, March 1998.

"Roads Analysis", USDA Forest Service, http://www.fs.fed.us/news/roads/01titlemain.pdf#xml=http://www.fs.fed.us/cgi-bin/texis/searchallsites/search.allsites/xml.txt?query=roads+analysis&db=allsites&id=3b29b2ce0, August 1999.

"Northern and Intermountain Regions – Line Officer NEPA Checklist", http://www.fs.fed.us/forum/nepa/loc.htm.

"Environmental Assessment Checklist", OIG Report #08801-10-At.

"Pike and San Isabel National Forests Cimarron and Comanche National Grasslands, South Platte Ranger District", USDA Forest Service, http://www.fs.fed.us/r2/psicc/spl/.

Appendix

Appendix A: Subject Matter Expert Experience

USDA Forest Service – South Platte Ranger District Employees

Fred Patton

Number of Years with the USDA Forest Service: 32.5
Number of Years with Project Planning Experience: 18
Number of Years on the Upper South Platte Watershed Protection & Restoration Project: 2.25

Jim Thinnes

Number of Years with the USDA Forest Service: 21
Number of Years with Project Planning Experience: 16
Number of Years on the Upper South Platte Watershed Protection & Restoration Project: 2

Steve Culver

Number of Years with the USDA Forest Service: 2
Number of Years with Project Planning Experience: 12 (mostly with Park Service)
Number of Years on the Upper South Platte Watershed Protection & Restoration Project: 2

Private Consultant

Brad Piehl (Consultant with Foster Wheeler Environmental Corporation)

Number of Years with Foster Wheeler: 2
Number of Years Consulting with the USDA Forest Service: 8
Number of Years of Consulting Experience: 15
Number of Years on the Upper South Platte Watershed Protection & Restoration Project: 1 (Work was completed on two projects)

USDA Forest Service – Inventory & Monitoring Institute (IMI) Employees

Tom Hoekstra

Number of Years with the USDA Forest Service: 23
Number of Years with Planning Experience: 15

Matt Turner

Number of Years with the USDA Forest Service: 15
Number of Years with Forest Planning Experience: 15
Number of Years of Related Experience: 8 (with BLM as a Forester)

Bob Lee

Number of Years with the USDA Forest Service: 21
Number of Years with Project/Forest Planning Experience: 21

Appendix B: BusinessGenetics Experience

BusinessGenetics Experience

Cedric Tyler
Number of Years with business experience: 19
Number of Years Consulting to related industries: 6

Ann Morrison
Number of Years with business experience: 15
Number of Years Consulting to related industries: 4

Rob Smith
Number of Years with business experience: 10
Number of Years Consulting to related industries: 2

BusinessGenetics provides:

- Over 44 years of business experience
- Over 12 years of experience consulting to related industries
- Industry strength & a proven business modeling methodology

Appendix C: USDA Forest Service Inventory & Monitoring Institute & Pike and San Isabel National Forest, South Platte Ranger District Summaries

Inventory & Monitoring Institute (IMI)

The Inventory and Monitoring Institute (IMI) is a USDA Forest Service nationally chartered organization, guided by a Board of Directors.

Mission

Provide technical leadership and service for agency-wide collection, management, and analysis of scientifically reliable social and ecological information used in ecosystem management.

Scope

- Includes National, Regional, State, and National Forest scales.
- Addresses inventory, monitoring and planning in the context of the USDA Forest Service ecosystem management business requirements.
- Facilitates and coordinates the development of efficient and effective inventory, monitoring and planning protocols.
- Focuses initially on improving internal USDA Forest Service information compatibility, and seeks increased integration with external agency efforts.

IMI Program Elements

- **Example Projects**

1.Business Process Analysis
- Agency wide Inventory, monitoring, and planning program requirements.
- Laws and regulations.

2.Information Collection
- Northern and Intermountain Region Pilot.

3.Information Analysis
- Analytical tools for business process analysis.
- Analytical tools for Forest Plan revision and project plan development process.

4.Information Classification
- World-wide ecological land system classification.

5.Information Management
- Web and knowledge base information systems.

6.Sustainability Monitoring
- Local Unit Criteria and Indicator Development (LUCID)

7.International Technical Assistance
- Albania Watershed Assessment
- Middle-East Watershed Monitoring Project

USDA Forest Service Pike and San Isabel National Forest, South Platte Ranger District

South Platte Ranger District Summary

The South Platte Ranger District is part of the Pike & San Isabel National Forests and Cimarron and Comanche National Grasslands. It is located east of the Continental Divide in the central Rocky Mountains and lies adjacent to the Denver Metro area in Park, Jefferson, Douglas, Clear Creek and Teller counties. It's proximity to Denver, with a population of over 2 million people, results in approximately 2,500,000 visits a year, a number that exceeds the total use on each of the 47 National Forests across the Nation. The South Platte District is 460,000 acres (net) in size with elevations ranging from 5800 feet in the east, to over 14,000 feet in the north.

Upper South Platte Watershed Protection & Restoration Summary

The Buffalo Creek Fire burned approximately 12,000 acres within the Watershed in 1996, resulting in the loss of several homes and essential forest cover on highly erodible soils. Heavy rainfall and floods following the fire resulted in two fatalities and caused substantial erosion and sedimentation. A downstream reservoir that supplies water to the Denver metropolitan area was adversely affected. The Upper South Platte Watershed Protection and Restoration Project (Upper South Platte Project) was proposed in 1998 by Denver Water, the Colorado State Forest Service, Colorado State University, the Environmental Protection Agency, and the USDA Forest Service, to respond to concerns about future catastrophic disturbances in the Watershed following the Buffalo Creek Fire and subsequent floods. The Project is addressing the catastrophic disturbance concerns by focusing on landscape vegetation patterns, soil erosion, and water quality within the Upper South Platte Watershed.

The USDA Forest Service, the Colorado Forest Service, and Denver Water are coordinating with other Federal and State agencies, local governments, and interested parties to plan, implement, and monitor restoration projects in the Upper South Platte Watershed. The Project is a collaborative, innovative approach to assess forest conditions and implement management actions on a landscape level on both public and private lands in the Watershed. The partners involved in the Upper South Platte Project will implement new methods of doing business to protect landscapes that cross ownership or jurisdictional boundaries. The Steering Committee provides guidance and oversight for Project planning, implementation, and monitoring.

The coordinated effort will reduce the potential for adverse effects to water quality, human life, and property. The goals of the project are to: reduce sediment; crown fires and risks to property; and create more sustainable forest conditions in the Upper South Platte Watershed. Forest conditions are considered sustainable if landscape goals are achieved while allowing for natural disturbances.

The project will improve water quality by reducing road and trail related sediment, stabilizing stream channels, and reducing noxious weeds. The project will also reduce high intensity crown fires using combinations of mechanical vegetation treatments (including timber sales) and prescribed fires. The project will reduce urban/forest interface hazards through educational programs and vegetation treatment on public and private lands. The actions will result in sustainable forest conditions similar to historic conditions. Emphasis will be placed on thinning stands, establishing openings, and maintaining snags and down logs. These forest restoration activities will be guided by research from the Cheesman historic forest landscape conditions within the Watershed.

Appendix D: Context for the displayed NEPA Process Workflow model

In August 2001, the USDA Forest Service (FS), with tasking through their Inventory and Monitoring (IMI) Office, submitted a request for BusinessGenetics to support and facilitate the interpretation and graphical articulation of a business model describing the activities associated with project planning, and to show the activities and workflows reflecting compliance to the laws, regulations and handbooks that govern project planning. Once completed, this effort will potentially provide the Agency with a clearer, more comprehensive understanding of the interactions and implications that laws, regulations and handbooks introduce into the land management project planning process. This is turn will provide insights and identify opportunity to explore efficiencies and evaluate effectiveness of current business processes supporting project planning and implementation.

The current draft business model is reflective of phase one in this process and although not yet complete in the context of a full business model (when using the BusinessGenetics proprietary methodology) begins to illustrate the challenges faced by the land management project planning teams on a daily basis. Typically this methodology supports development of representative models reflecting business activities, the elements of time, location, information and organization, (all elements of a business process), extracted into a single workflow view (business process flow).

A *business activity* model described using the BusinessGentics business modeling language (xBML[SM]) represents a single atomic dimension of the business process and is essentially a de-composition diagram representing “levels” of activities identified as necessary to achieve a stated business purpose or goal. Formal rules apply in the development of the model to ensure integrity of both model content and structure. The business activity models developed to date reflect business activities both *literally* interpreted from existing USDA Forest Service documentation and the experiences of highly qualified USDA Forest Service Personnel (from the Inventory & Monitoring Institute and the South Platte Ranger District Office) as Subject Matter Experts (SMEs), all considered in the context of a given forest project, which in this case was planning for a timber sale.

Over 800 activities were identified, the majority of which were tracked to requirements engaging the NEPA process and other applicable laws, (such as ESA), all identified as necessary for compliance under current written project level direction for conducting an appropriate environmental analysis. The draft business flow model presented represents a snapshot of the identified NEPA and other applicable law related business activities extracted into the NEPA process, out of several workflow views. While this business process model is not yet complete in the dimensions of time, location, information and organization, the subject matter experts were able to identify an appropriate business flow and over 100 process interaction points in a single process view. This would indicate a requirement for sophisticated synchronization of concurrent, complex business processes with heavy resource load to meet project compliance for environmental analysis and documentation.

See envelope.