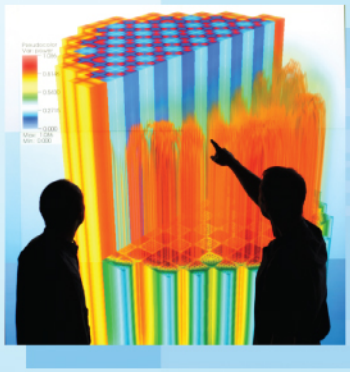
Power uprates
and plant life extension

CASL-U-2012-0052-000

Consortium for Advanced Simulation of LWRs

CASL Enterprise Project Management (EPM) Tool, a Unified PM Platform

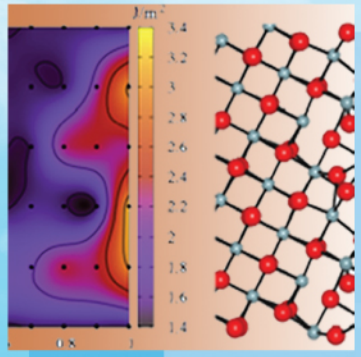


Engineering design
and analysis

Science-enabling
high performance
computing

Jeff Banta, CASL Program Manager
Oak Ridge National Laboratory

March 31, 2012



Fundamental science

Plant operational data

U.S. DEPARTMENT OF ENERGY | Nuclear Energy

CASL-U-2012-0052-000

CASL Enterprise Project Management (EPM) Tool, a Unified PM Platform

Jeff Banta, CASL Program Manager

March 2012

Introduction

The Consortium for Advanced Simulation of Light Water Reactors (CASL) applies existing modeling and simulation (M&S) capabilities and develops advanced capabilities to create a usable environment for predictive simulation of light water reactors (LWRs). This environment, designated the Virtual Environment for Reactor Applications (VERA), incorporates science-based models, state-of-the-art numerical methods, multi-physics integrated solutions, modern computational science and engineering practices, and uncertainty quantification (UQ). Ongoing validation of VERA relies upon data from operating pressurized water reactors (PWRs), single effect experiments, and integral tests. VERA will be designed for implementation on current desktop computers, capacity platforms (e.g., clusters), and the engineering workstations of the future. Selected components will also be capable of executing on current U.S. Department of Energy (DOE) capability and leadership-class high performance computer (HPC) systems.

The CASL vision is to predict, with confidence, the safe, reliable performance of nuclear reactors, through comprehensive, science-based modeling and simulation technology that is deployed and applied broadly within the U.S. nuclear energy industry. To achieve this vision, CASL's mission is to provide leading edge modeling and simulation capabilities to improve the performance of currently operating Light Water Reactors.

Four strategic goals focus CASL in accomplishing its mission and fulfilling its vision:

- Develop and effectively apply modern virtual reactor (VR) technology;
- Assure nuclear safety and address operational and design challenges;

- Engage the nuclear energy community through modeling and simulation; and
- Deploy new partnership and collaboration paradigms.

CASL will pursue six avenues for attaining its goals:

- Virtual Environment for Reactor Applications (VERA);
- Industry challenge problems;
- Technology delivery;
- Targeted, enabling R&D;
- Education and training; and
- Collaboration and ideation.

It is the CASL Enterprise Project Management strategy that addresses the need created by CASL, a largely out-sourced geographically dispersed DOE program run out of the Oak Ridge National Laboratory (ORNL), to communicate and democratize projects as they're planned, managed and to track their execution through all phases from initiation to close out.

What is the CASL EPM Tool?

The CASL EPM Tool is a unified software tool for a [virtual] project organization oriented tool upon which projects are efficiently, and optimally, managed throughout all 5 phases (i.e. initiating, planning, executing, monitoring & controlling, and closeout) of project life-cycle. Information is entered, created, shared, exported and managed regarding the projects of the organization. Roles are created, defined and assigned to every team member. Workflows created direct/inform team members on project/process management steps that drive compliance as well as provide the ability to change (when change is needed or requested); and it enables team members to collaborate, discuss, review and approve information related to their tasks and projects.

Enterprise Project Management (EPM) is a broad term that refers to processes for improving the conduct and coordination of projects across an enterprise (e.g. business, organization). The term predates project portfolio management (PPM), and its use may presume that PPM is included as a subset of EPM. A project portfolio is a collection of projects (and, perhaps, other work) grouped together to facilitate the effective management of that work. PPM tools vary greatly in their capabilities. However, a common characteristic is that all PPM tools collect and organize into a central database pertinent information about proposed and ongoing projects (data such as project names, objectives, resource needs, timelines, etc.). The tool gives users (typically managers or senior executives) a bird's eye view of projects, making it easier to spot inefficiencies in the project portfolio (for example, redundant projects). Being able to quickly access, review, and compare a large number of projects aids project funding decisions and other key financial and business choices that the organization must make.

What is a Virtual Project Organization?

To achieve the goal, set by DOE, CASL sought to develop a team of the best and brightest [today's best of the best if you will] minds in nuclear engineering, materials, fluid dynamics and heat transfer,

numerical methods, etc. as quickly as possible to address the toughest and most difficult to resolve problems of the nuclear industry regarding the potential opportunities to safely increase thermal output from the existing fleet of light water pressurized nuclear reactors. To expedite the availability of scarce [best-of-the-best] human resources a strategic decision was made not to require geographical collocation of all program personnel as that could significantly (and negatively) impact the participation of critical individuals. The result is a large, highly technical and self-motivated, virtual project organization (Handy, 1995) focused on addressing these challenges in a coordinated fashion, each from their own locale.

For any organization to succeed trust is needed, for a virtual organization it's the number one issue (Adams, 1997), see Figure 1. By definition, the virtual [team] organization spans geographical regions, time zones, and potentially employers as well. To bridge these gaps the same foundation and pillars support success of the organization; the organization must trust, have group identity, share information, have clearly defined authority, and understand information throughout the organization.

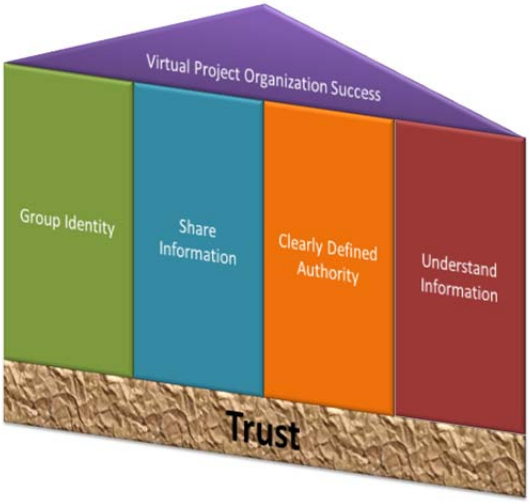


Figure 1; Success of a Virtual Project Organization is based on similar pillars as any other

Trust

Of the five core components to success is foundational and spans all others. Without trust there can be no credibility; and without credibility an organization that does (or can) not meet regularly, or just have that ad hoc hallway meeting, has no hope of succeeding due to constant initial disbelief of the information it has or receives. Trust is the most difficult to build (Adams, 1997) for a project manager of a virtual team due to lack of immediate collocation; moreover, for a virtual team [separated by geography, language, etc.] trust will take longer to establish and as a result may realize temporary setbacks until the majority of the team members are comfortable with one another.

- In CASL, this trust is built over time with regular (but no frequent) face-to-face collocated project, team and program meetings. To bolster the infrequent collocated meetings, use of the VOCC technology (Vidyo) to hold and participate in telepresence meetings is provided. Vidyo provides the enhanced eye-gaze meeting experience such that the nuances of body language, eye-to-eye connection, etc. experienced in a collocated meeting are achieved without the need of travel or physical relocation of personnel.
- The EPM tool must enhance the level of trust throughout the program by having use of LDAP login, promote information sharing to all within the program [having access to that information] tracking of changes made and by whom, and be able to escalate issues as they occur.

Group Identity

Developing a group identity across distances can be difficult as people will normally associate with others with commonalities (i.e. region, language, heritage, race, religion, etc.). This fortunately is not a

typical challenge to organizations that are collocated with an evenly distributed demographic makeup. The challenges towards developing group identity stem initially from the challenges of establishing trust (e.g. fewer shared experiences, lack of cohesion, little understanding of other member's organizational role or responsibility).

- In CASL, group identity is established with frequent collocated and virtual (i.e. Vidyo) constructive communication via CASL extended leadership team (ELT) and Focus Area telecons with senior leadership team (SLT), independent Focus Area team telecons, regular planning and milestone review meetings for each period of performance (i.e. plan of record), and the annual CASL roundtable meeting – where all team members are invited to attend, review, comment, [constructively] complain of the year's activities, successes and failures.
- The EPM tool must be able to associate team-members by project, Focus Area, Challenge Problem and employer/partner affiliation.

Information Sharing

In any project, or organization, accurate and up-to-date information is critical to its success. Therefore, the easier it is for team member, management, executives, and customer (where appropriate) to obtain [or provide] information to the team the more informed each group/individual should be and with it more improved decision making and reduced risk realized.

- In CASL, there are numerous avenues (technologies) for information sharing; one is the Vidyo telepresence technology where team members are able to participate in an enhanced telepresence discussion sharing information; second, is the CASL SharePoint where team members a able to (with proper permissions) access any of CASL's information; third, CASL's project management tool (currently Trac) whereby any team-member is able to (with proper permissions) access a milestone/project and read its scope, execution plan, execution responsibility, predecessor/successor relationships among other projects and completion criteria.
- The EPM tool must have this capability to democratize information by multiple levels (i.e. project, challenge problem, and Focus Area).

Clearly Defined Authority

Uncertain roles and responsibilities of team members, clashing cultures, unclear expectations, and less than clearly defined processes create impediments to decision-making and team cohesion.

- The CASL management plan sets roles and responsibilities throughout the program such that clear lines of authority are in place an understood. Moreover, it [the CASL management plan] also describes how change and risk are addressed and documented.
- The EPM shall be able constructed in such a way that supports the program's organizational hierarchy and business model.

Information Understanding

Ensuring that every team member understands his/her responsibility and the information needed to execute the tasks assigned can be challenging enough in a collocated environment; a virtual team is even more easily threatened by its weak linkage in the information understanding chain. It is therefore imperative that 2-way, collaborative, constructive dialogue take place to ensure understanding.

- In CASL, information understanding assurance takes place at multiple levels with Focus Area regular meetings and stand-ups, SLT/Focus Area meetings to discuss status and issues related to that focus area, ELT telecons to discuss general status and issues of the program.
- The EPM tool shall provide ability to communicate at each level (i.e. task, project, Focus Area, OMT, SLT) to ensure communication and understanding is optimal. Additionally, where practical workflows will be in place such that proactive responses ensure ownership of roles and responsibilities.

How will the EPM tool support CASL to execute projects?

To maximize the positive benefit of the EPM tool; the EPM tool shall work within (and support) the organizational structure of the CASL management plan, Baseline Change Control (BCC), democratizes information to all members, and support collaborative problem solving.

The EPM tool must therefore support the virtual project organization through:

- Trust
- Building Group Identity
- Sharing Information
- Clearly Articulating Roles & Responsibilities
- Ensuring Understanding of Information

EPM Tool Access

The CASL EPM tool will be installed and accessible on the casl-dev server (John Turner: system owner) and shall require utilization of LDAP and existing UCAMS ID login and password. Two part login is not required at this time as sensitive (or proprietary) information is not allowed on the EPM tool.

Roles & Responsibilities

Roles and responsibilities shall be integrated into the EPM tool to mirror existing roles and responsibilities in the CASL management plan.

Workflows

The EPM tool will utilize workflows, escalation, etc. to ensure conformance, responsibility, and appropriate visibility of decision making and issues.

How do we measure virtual project team management success?

Just like measuring the success of any collocated project team; success is measured by the timely completion of projects within budget without having significantly modified delivered scope or deliverable's features. Tracking and measurement of those critical items is required by the EPM tool such that regular reports and dashboards can capture and display. Having project financials from each Focus Area Lead; cost and schedule performance indexes can be developed and monitored to track, and provide trending information towards, timely completion and on-budget completion of projects throughout the CASL program.

References

Journal Articles

Handy, Charles. (1995). Trust and the virtual organization. *Harvard Business Review*, 40-50.

Adams, John & Adams, Laura. (January 1997). The virtual project: managing tomorrow's team today. *PM Network, 37-41*.