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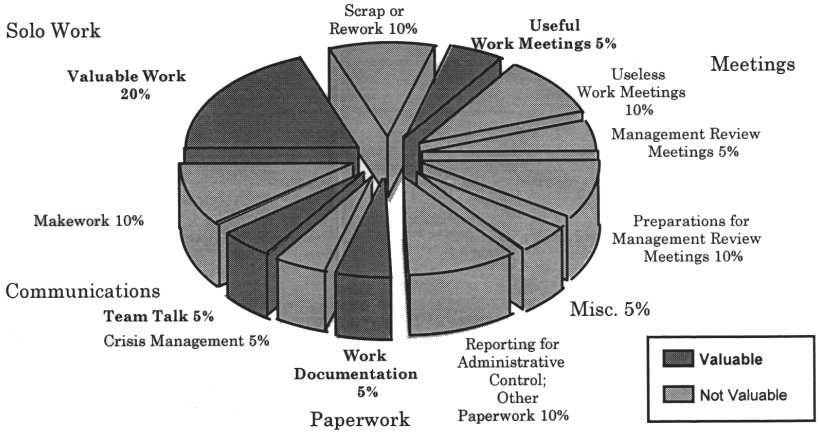
VIRTUAL COLLABORATION: PRACTICALLY SPEAKING

Since the phone was invented, virtual collaboration has been on the increase. Each year, technology allows more and more sharing of information. All of us now participate in meetings where there are multiple, simultaneous channels of information during an entire meeting. These channels include voice, body language (if videoconferencing is used) Powerpoint presentations and MS-Word documents, access to the company intranet, and the world wide web. People can also jump up from the table spontaneously and plug their laptop into the LED projector and share information. The amount of information brought to bear in a meeting these days, as compared to a decade ago, is extraordinary. In terms of "24/7" collaboration, as opposed to pre-planned meetings, the same holds true. The enabling technologies are not bounded by the human need for rest and sleep; they will need to support real time meetings, as well as a lifetime of collaboration.

There Is More To It Than Virtual Meetings

Whether one is doing research projects involving global alliances, or the much more time-bounded subject of product commercialization, there is more to consider than the Virtual Collaboration associated with meetings. Practically speaking, if one analyzes the Work Breakdown Structure for any medium-large hardware or software project, there are thousands of combinations of communications and activities necessary to complete a project. The complexity of these combinations was documented by Steven D. Eppinger at MIT using the now popular Design Structure Matrix. The number of possible interactions for a project is equal to (N(N-1)!)/ 2 where N is the number of people. *A "virtual collaboration environment" or "virtual workspace" requires that "the resources of each person be available to all other persons in the collaborating group when they need them, individually or collectively."*

In 1990, P. R. Nayak of Arthur D. Little in Cambridge, MA published one of the definitive studies of time utilization for a typical engineer during product development projects [see figure]. Note that meetings consume only 30% of resource time. Technologies that support only that 30% will have limited impact. The ADL study helps to illustrate that there are a wide range of activities that must be supported in a Virtual Collaboration environment.



Source: P.R. Nayak, "Managing Rapid Technology Development," Arthur D. Little, Cambridge, MA, August 1990

Defining 24/7 Virtual Collaboration Enabling Areas

The list of required enabling areas below is representative but not complete. However, this partial list illustrates some of the remaining opportunities and challenges for achieving Virtual Collaboration. Remember that unless the service level of the enabling technologies is 24/7 they are not truly virtual.

- Common Ideation & Invention
- *Product Assumptions, Strategy, Plans, Trade-Offs*
- Virtual Voice, Video, Data Meetings
- Product & Process Designs, *Simulations, Models, Analyses*
- Product & Process Capability *& Limitations*
- *Product & Process Test, Reliability, & Warranty Data*
- *Standard Subassembly, Subroutine, Module, Part, Component, etc., Libraries*
- *Intellectual Property Capture & Management*
- *Knowledge Capture & Management*
- *Common Searchable Repository*
- Document/Design/Code Revision & Configuration Management
- Project Management
- Project Costing
- *Product Costing*
- *Lessons Learned*

There has been great progress in the past few years, but difficult issues remain. It will take a decade or more before a solid argument can be made that Virtual Collaboration will be a candidate to replace physical collocation as the most effective development environment. Most company data security policies, even between strategic partners, severely limit unmonitored access to design information and supporting data [see italicized items above]. Distrust is likely to remain a limiting issue for Virtual Collaboration. When distrust and security issues are overcome, ownership of and rights to collaboratively invented intellectual property will take center stage. Virtual Collaboration is still a noble goal but not yet a working reality. PD

To contact Brad Goldense call 781-444-5400 or email blg@goldensegroupinc.com

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