CUTTING EDGE TEAMWORK

A HIGH TECH COMPANY IN CHANGE

BACKGROUND NOTES

THE COMPANY:
Storage Tek Corporation is a three-decade, Fortune 500 company of 10,000 employees world-wide. The main manufacturing and R&D capabilties are located at a 5,000 employee site in Lousiville, Colorado (8 miles east of Boulder, Colorado).

Storage Tek manufactures large information storage devices for main-frame computer systems. Major customers world-wide are banks, airlines, and utilities, who use massive amounts of information on a daily basis. Any loss of that information can be an extremely costly, and potentially dangerous issue. Hence, the extreme emphasis on "field reliability" of Storage Tek's products whose main competitors are the IBM's and Hitachi's of the world.

THE CHALLENGE:
The disk drives built by Storage Tek can be the size of a refrigerator. At the heart of these large disk drives is the "head disk assembly" (HDA). The HDA unit is a collection of electronic components and moving parts that must be assembled to tolerances measured in microns.

Unfortunately, Storage Tek was experiencing difficulties in producing a sufficiently high quality product. Assemblies were failing in the field, costing the company millions of dollars for service calls and returned items. A new vice-president of HDA manufacturing was determined to engage employees in an effort to turn this situation around.

AN OLD STYLE ORGANIZATION IN A NEW WORLD:
HDA had 300 employees, 200 in direct labour, and 100 in support, mainly engineering roles. Each of the operators (most of them, semi-skilled and female) sat at a work station where for their full shift, they did a particular, precise function in assembly of part of a unit, passed on to them by a conveyor. If there were problems in the flow of work, engineers would be called in. The organization of work in this high tech plant had many characteristics of an automobile assembly line--in a "clean room".

TRAUMA FROM UNPLANNED CHANGE:
When another division of Storage Tek--the Thin Film Tape Head factory--had a similar need to increase employee involvement, management installed a new "team" structure in a matter of days:

> "Teams were selected by managers, based on process segments demarcated by physical barriers (clean room, machining area, etc.). After day and a half employee orientation sessions Wednesday and Thursday, the new structure was mandated to begin the following Monday. This resulted in months of disruption and conflict, and an array of technical and social problems.
> "[Fortunately] managers acknowledged the project's shortcomings. About six months later, ...they commissioned...systematically derived redesign plans, generated by all employees."

Reference: "From Trauma to Recovery: Work Redesign in a Storage Tek Factory", a report written with the cooperation of Storage Tek's Thin Film Head division, by Mary B. Fewel.

EMPLOYEE REDESIGN OF WORK SYSTEMS:

HDA manufacturing management took a different approach (that eventually informed the "recovery" in the Thin Film Tape Head factory). When the plant manager was aware of the difference between simply creating self-managing teams and taking a systemic approach, he hosted a workshop for all managers to explore whether a socio-technical systems approach had merit for the HDA organization.

As a consequence of a positive response to the one-day workshop, the plant manager formed a steering committee to govern a change effort. The steering committe included the vice-president of manufacturing for Storage Tek, the plant manager, a manufacturing and engineering first-level manager, a human resources representative, and later, an engineer and two factory operators.

The creation of a vision statement became the first responsibility of the steering committee. The vision statement helped govern the transition through its clarification of the philosophy, values, and ideal future state to which the change process was to aspire. The vision statement also represented the steering committee's commitment to go forward with the work redesign project.

Now, people throughout the organization needed to be informed about what was to happen. The vision statement provided a sense of direction, but people needed to know more. The steering committee asked all employees to participate in a Socio-technical Systems Assessment Survey (Pasmore, 1988). Through this process, the entire organization began to learn where they were in relation to an optimum socio-technical design for the organization.

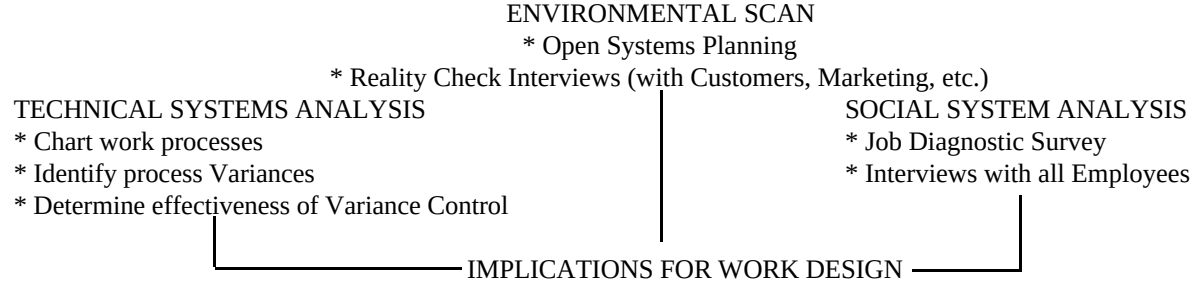
Reference: This account of work redesign in HDA is based upon a presentation made to The Ecology of Work Conference, June 27-29, 1990 by Storage Tek internal consultants, Gary Frank and Bob Rehm.

SOCIO-TECHNICAL ANALYSIS: A 'CONCURRENT' METHODOLOGY

Often, at this stage in the process, a steering committee selects a full-time design team to conduct a work system analysis and create a redesign plan. This set of activities may require more or less a year.

In the rapidly changing, high-tech environment, a faster "cycle time" had to be achieved for redesign. Whereas the steps of socio-technical systems analysis have historically been done sequentially, HDA created an adaptation in which the 3 components of analysis were done concurrently. The steering committee took responsibility for the Environmental Scan (of customers, market trends, etc.). Meanwhile, 10 elected operators and engineers worked with a manager to do a Technical System Analysis of the HDA process, and simultaneously, a similar-sized group conducted a Social System Analysis.

ANALYSIS PROCESS



All 3 teams worked concurrently and finished a quality analysis in 4 months, (with each member devoting 4 hours per week). The project involved 3 times the number of people, used 1/4 the person hours, and required 1/3 the time for a traditional analysis process.

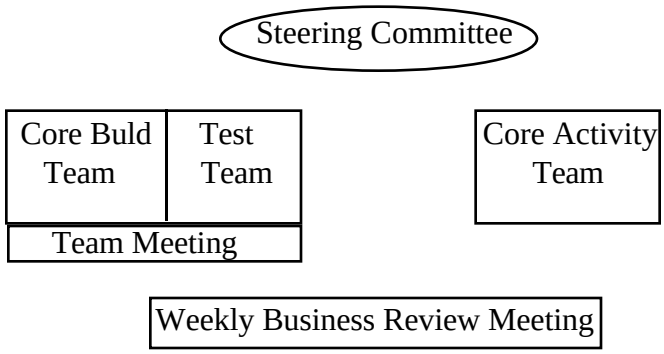
THE NEW DESIGN OF WORK in HDA:
The steering committee and the analysis teams met together to educate each other about what they had learned. They formed mixed teams (of technical, social, and steering committee members) to synthesize the analysis and develop a common list of implications to which a redesign needed to respond.

Then, each team created a redesign concept for the plant organization. (Five levels of the organization, from vice-president to line operator worked together on this redesign.) The teams presented 4 concepts to all 300 employees of HDA. Based upon the employee feedback, a new team (half-time on the project) composed of 3 members from each of the steering committee and the analysis teams finalized a detailed redesign. They produced an organizational plan ready for implementation in 2 months.

Three teams of operators and engineers were created. Assisted by a Test Team, a Core Build team managed the preparation of sub-assemblies and the final assembly of units. Now, each operator assembled complete units, fom start to finish, (rather than installing a single part into all units). Operators felt more ownership and control over the quality of the end-product.

The operators initiated a JIT process. They had access to computer-tracking information that enabled them to start and stop production to corect problems without constant reliance on engineers. They managed their daily production schedule and work assignments, through a daily meeting of all teams.

Meanwhile, the Core Activity team was responsible for all the engineering changes to the manufacturing process. It met regularly or was called into action to address a problem identified by the operators. Engineers and opeators worked together to solve difficult technical problems.



NEW ENGINEERING PRACTICES:
In the past, most of the technical problems were identified by engineers and technicians. They decided what was important to fix. Then, engineers came up with the solutions. The operators implemeted the engineers' designs. In the new organization, the engineers became a collaborative, support group to the operators. Together, they decided on priorities and solutions. This did create some unique communication challenges which required new skills and mutual respect. It is also led to a different engineering philosophy as stated by a senior manufacturing engineer in the video "Cutting Edge Teamwork":

> "Once you're working from a level of good communication and mutual respect, you don't have to engineer around everything...You don't have to spend a lot of dollars to engineer something so that somebody can't possibly make a mistake...You rely on the operators to do the job and do it right."

PLANT GOVERNANCE:
After the redesign, manufacturing and sales managers, and now, operators and engineers from the work teams met to hold a weekly Business Review. Previously, this had been a managers-only session. Now, there was an open forum to share information, manufacturing plans, customer feedback, and to discuss plant-wide operational problems and solutions. The Business Review became a meeting of the plant as a "community".

The steering committee continued to meet after the redesign plan had been implemented. Part of the justification was an understanding that development of the self-management capability of the work teams would be evolutionary, and that implementation of the redesign would take place over a longer-term. Another reason was the expectation that redesign would need to be continuous, as new issues and opportunties confronted the organization.

More fundamentally, the steering committee was part of the redesign plan--a bottom-up leadership that complemented the more traditional top-down leadership hierarchy. An example of the leadership role played by the steering committee (including managers, engineers, and operators) was their selection of the new director of manufacturing for HDA.

MANAGERS' FORUM:
Participative work redesigns succeed or fail depending on the reactions of managers, particuarly those at the first-level. Many managers in the Storage Tek HDA plant were fearful or uncertain about their own futures, when the redesign process began.

After the managers facilitated the survey feedback and educational sessions with their employees, prior to the start of the socio-technical systems analysis, they decided to keep involved and support each other in the changes by instituting a managers' forum.

The forum became a regular, bi-weekly meeting in which managers shared information and experiences related to the work redesign effort, explored their changing role, and helped them be pro-active and influence the new design and its ongoing implementation. Undoubtedly, the forum helped gain the commitment and understanding of managers for the work redesign.

OUTCOMES:
The concurrent analysis and design methodology produced a high quality redesign plan. Ten per cent of the employees were directly involved in the analysis effort, and 80% of the time, they were doing their regular job and talking to their peers about their ideas. The redesign process was very visible and participative. Key to the success of this methodology was effective integration of the parallel technical, social, and environmental analyses, ably supported by Storage Tek internal consultants.

During the two years following the work redesign, HDA yields and product reliability in the field improved dramatically. The commitment and methodology for planned work redesign diffused to other divisions within Storage Tek, (e.g. Thin Film Tape Head factory).

As an indication of the depth to which the redesign and its values had penetrated the organization, when the HDA product was terminated ("end of life"), the employment of HDA workers and managers was protected, and their skills were much sought after within the rest of Storage Tek. Not only had product yields for HDA grown through redesign--so had the skills of the people of HDA!

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(More articles on "accelerated" and "paticipative" work redesign are referenced in the "Good Reading" page of The Modern Times Workplace web site.)