

# Cyber Action Learning and Virtual Project Teams for Leadership and Management Development

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## Organizational Setting

3M is a US-based company that was founded in Minnesota in 1902 and has grown to a company with annual sales of over \$15 billion USD and operations in 63 countries worldwide. Although its global headquarters are in St. Paul, Minnesota, six of its 40 product divisions are located in Austin, Texas. 3M has manufacturing operations in 42 countries and laboratories in 25 countries. While most of the laboratory work outside of the US involves technical service, manufacturing support and product modification, an increasing amount of technology development is conducted outside the United States by the more “mature” laboratories, especially in Germany and Japan.

The maturity of these laboratories were defined by their R&D capabilities and classified into four levels:

- Level 1: Technical support for existing products
- Level 2: Product modification
- Level 3: New processes
- Level 4: Research and Development.

Of the 25 laboratories around the world, most of the Level 4 laboratories were located in the US while laboratories in the newly emerging markets, such as China and India belonged to Level 1, despite the increasing technical competence of these two countries.

For more than a hundred years, 3M has excelled on its technical competence and engineering ingenuity. It has demonstrated a strong R&D orientation and corresponding technical culture, and illustrated by the vast array of more than 50,000 products in its current catalogues. Continuous innovation in either process improvement or product development, were the key for 3M's survival and continued success. However, internal transfer of know-how and products from US laboratories to developing countries' laboratories have been limited by concerns for intellectual property rights and the availability of technical competence locally.

The 3M Technical Centres in various Asian countries represent different stages of organisational development, from embryonic to more complex set-ups. Situated in the fastest growing region of the world, there was an increasing need for 3M to capture more fully market potential in terms of business growth and to tap the growing technical competence in the region for innovations. It is in this context that this case study is presented to illustrate how workplace training and learning could be used to achieve strategic objectives of the organisation and contribute to bottom line operational performance through faster diffusion of learning and innovations across national and functional boundaries.

### **Business Issue**

The need for greater integration of the non-North American operations into the operational core of 3M became obvious when 3M's sales outside the US exceeded 50 percent of the total revenue. The shift in the company's economic focus made it necessary to question almost 100 years of assumptions. And the challenge was to shift 3M's psychological and corporate culture from one in which the US served as the hub of the product creation wheel to a more integrated global community with each country and employee assuming greater responsibility in producing knowledge and in participating in product development and innovation.

With this new vision, information exchange and cross-border learning needed to happen within and across regions on an on-going basis. Part of the strategy was to ensure that national silos were permeable and cross-border interactions more organic. Thus, globalisation affected not only where the company did most of its business, but also how the core business processes facilitated or disrupted global exchange and seamless operation. As the result, 3M had to address the behavioural and social dimensions of the business, and to redefine its corporate identity.

An organisational change of this magnitude could only be achieved if it was approached through a process-based intervention. It needed to be experienced as

an organisational learning process and framed as a major journey of transformation through which multiple groups at multiple levels of the organisation moved in concert toward one outcome. The critical mass in this mega-transformation was the linking pins of various functional groups and of different managerial/supervisory levels. In 3M's technical community, managers and supervisors in laboratories around the world needed to lead the process of creating regional hubs and teamwork.

The innovative capacities in Asia could improve and be better leveraged by strengthening the management and leadership capacities of these individuals, and by establishing cross-border learning networks. Creating synergy amongst diverse technical centres was expected to strengthen 3M's competitive advantages against low-cost imitators in the region.

Managers at the 3M Technical Centres in Asia were a diverse cultural group which created divergent and convergent leadership challenges. In Taiwan and South Korea, for instance, the challenge was to provide higher value-added products that could meet the demands from the growing high technology sectors in these two countries, ranging from cellular phones to liquid crystal display panels. In China and India managers were challenged to grow the technical service organisations fast enough in order to provide technical support and services to clients located across huge territories.

3M technical centres were normally managed by a local employee who reported functionally and financially to the business manager for that country. Technical managers also reported, via dotted line, to an area Technical Director in Singapore. Except for Singapore, each technical centre manager was the sole laboratory manager in each respective country. His isolation from his peers was complicated by geographical distance, cultural differences, and linguistic barriers. As a group, these Tech Centre managers met periodically to discuss the technical aspects of the work and to conduct vertical communications upwards. Rarely was time allotted for horizontal communications or social bonding to encourage peer contacts and consultation outside of these meetings.

One mechanism available to foster greater cohesion and team spirit at the horizontal level is training, which provides not only the opportunity to develop managerial and leadership skills, but also to build personal networks based on shared experiences. However, training opportunities within the regional technical community as a whole were less frequent and typically occurred in each Tech Centre manager's home country, not as a peer group. As a result, working rapport among the technical managers was insufficient to support open and informal horizontal communication. Consequently, the networked regional organisation

within the technical community was theoretical, which was also true for other functional areas. Most exchanges among Asian technical centres remained brokered through US headquarters.

Was it possible to build psychological bridges amongst this group of culturally diverse and geographically dispersed individuals? Could they function as a regional information exchange network? How could the climate for cross-border leveraging be enhanced in order to utilise the available resources and know-how in the region? 3M hoped that by adopting a comprehensive workplace learning strategy and a peer consultation process, such knowledge exchange and mutual support network would naturally emerge.

### **Training Development Process**

The entire project involved a four-year long leadership development learning forum which was implemented in three phases and covered two levels of managerial staff (technical managers and technical supervisors). Involving the next level down in this learning process was part of the phased implementation to strengthen the implementation capabilities of the national technical centres.

Success criteria for this regional leadership development program were established at the outset, and included both individual benefits and improvements to 3M's business objectives. The following principles were established to guide the overall design of the leadership forum:

- It should be self-directed learning and based on actual 3M business requirements,
- It should be an on-going process and integrated with the daily work of the individuals, and
- It should strengthen membership and leadership skills in a multi-cultural peer group.

In accordance with the success criteria and these design principles, an action learning approach combined with action research method were chosen for what became the Asian Technical Manager Learning Forum (ATMLF).

Phase I of the ATMLF focused on leadership development of the Technical Managers with the aim to strengthen their organisational and management capabilities. Phase II focused on entrepreneurial leadership to develop a strategic technical plan that could lead to innovation and new business initiatives. Phase III focused on the implementation of the strategic technical plans developed during the Phase II.

At the end of each phase, there was a cyber presentation of project work, a virtual closing ceremony chaired by the senior VP for technology and publication of project reports for internal dissemination. Evaluation consisted of an assessment of accomplishments in both personal and business terms, reflection, and a look to the future.

A blended approach was used for delivering the ATMLF. With the exception of one short face-to-face kick-off workshop and mid-term review, the rest of the forum took place via intranet and other virtual media, such as video and audio conferencing, asynchronous chat and on-line project work.

Modifications to the program design were made for Phase II in order to leverage the learning acquired by the consulting team during the Phase I of this program, and are discussed in the Lessons Learned section of this case study.

### **Description of the Training Program:**

Action learning, pioneered by Revans (1982; Yiu & Saner, 1998), involves working on real work opportunities, problems, tasks and projects. It encompasses a learning cycle of *action, reflection, theorisation* and *application*. Learners are expected to try out new behaviours, to reflect critically on their experiences, to distil some generalizable principles, and to try them out in other similar contexts. Action learning became the foundation for the Asia Technical Managers Learning Forum.

In the context of ATMLF, the linkages between action and reflection were explicitly made. Managers were asked to work in a peer group on existing problems and to formulate recommendations based on research and data analysis (action research). This combination of action research and action learning posed considerable challenges for the training manager in charge of the process and guaranteed a higher return on investment. Project reports which contained investment proposals or action plans were presented to the Managing Director of the residing country or to the decision makers at the 3M headquarters for consideration.

The course objectives of the first two phases of the ATMLF were to provide education and training which were

- relevant to all Asian locations where 3M laboratories were located
- unique to managing a laboratory within 3M
- would strengthen team cohesion in the Asian region
- would foster inter-country and intra-regional synergy within 3M's Asian technical community

**Learners.** The target population of this learning forum was initially the Technical Managers heading various technical centres and laboratories in China, Hong Kong, India, Philippines, Singapore, South Korea, Taiwan, Thailand and the regional Technical Managers from 3M's Asian regional headquarters. A total number of 12 participants were selected for this management development program.

Geographically, the participants and facilitators were separately located in three continents (Asia, Europe, and North America), ten countries and five time zones. The greatest time difference between two locations was 14 hours while the smallest time difference was one hour. In addition to the geographically dispersed locations of 3M, the participants represented culturally diverse groups as indicated in Table 2.

Chinese			Singapore	Indian	USA	New Zealand	Australia	Filipino	South Korea
Mainland	Taiwan	Hong Kong							
1	1	2	1	1	1	1	1	1	2

Table 2. Cultural backgrounds of the participants

Within the context of the training, two types of groups were formed, a project group and a learning group. The project group formed to work on real time issues identified by the Regional Technical Director and hosted on a voluntary base by a specific site which was weighed down by a problem. Each of three project groups worked independently on a leadership issue with the manager involved and three peer consultants.

The learning groups reflected on learning strategies and group behavior. They were formed on the basis of each participant's learning style as an activist, reflector, theorist, or pragmatist. These four learning styles parallel the four components of the action learning cycle. Project sites managers comprised their own learning group.

**Instructor Team.** The instructors included an internal technical education professional at 3M's US headquarters and an external consultant in the Asian region with expertise in organisation development and adult education. While the internal consultant contributed a corporate cultural perspective, the external consultant added the viewpoint of a management development professional with extensive global savvy and sensitivity to Asian cultures.

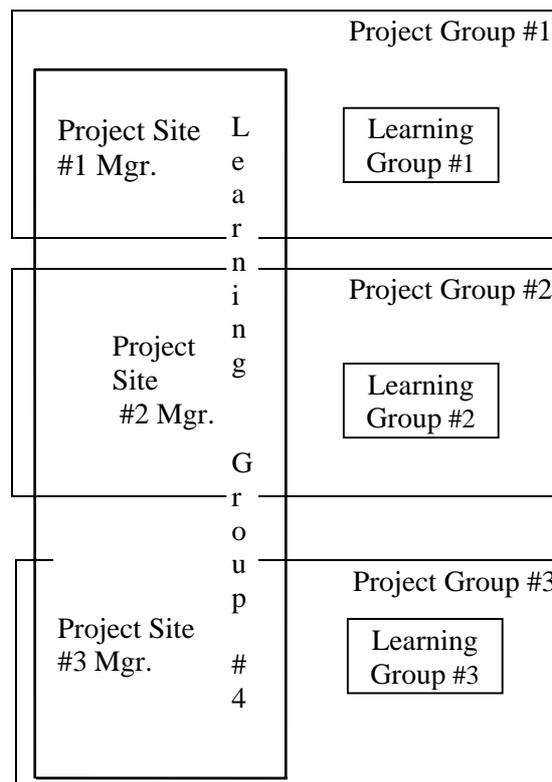


Figure 1. Learning and Project Teams

**ATMLF Elements.** The action learning model provided an excellent framework for learning in a business climate that mandated pragmatically focused education and results. The Forum (ATMLF) consisted of the following components:

1. *Action learning projects.* Business concerns were selected by the participating Technical Managers in consultation with the regional Technical Director.
2. *Work-based Project Learning Sites.* Instructors selected three voluntary locations which were expected to yield positive learning experiences and business results.
3. *Pre-work.* Pre-work included questionnaires regarding learning style, learning objectives and work experiences
4. *Seminar and Team Building.* A 3-day face to face workshop was held in Korea designed to form virtual learning teams, to start initial project

planning, and to acquire basic knowledge and tools for future project-based action learning.

5. *Electronic forums.* 5 electronic forums were created for group discussions and for capturing the knowledge created and exchanged amongst members.
6. *Video/Phone conference meetings.* Regular group meetings were held via video or audio communication channels. Project teams met online to discuss projects and received support and input from instructors. The group also discussed issues related to group dynamics and shared feedback.
7. *Compendium.* A collection of project reports was published and distributed to each participant, country business head, and the Vice Presidents responsible for the Asia region and the international laboratory operations.
8. *Virtual Graduation.* A closing ceremony was held at the end of the ATMLF with class photos, certificates, and executive speeches.
9. *Work-Based Projects.* Strategic planning was identified as a key area for improvement for the Technical Managers and implementation of this plan for the Technical Supervisors.

## **Results of the Training Program**

The success criteria established at the outset of the ATMLF were fulfilled. Results obtained from the teams differed depending on multiple factors such as time and energy invested, willingness to tackle difficult issues, and different perceptions regarding expected benefits. Most importantly, results differed according to each team's ability to manage its project and team dynamics. All things considered, most of the results were outstanding.

### *Phase I Results*

Most of the proposals put forward by the peer consulting teams were adopted and put into practice by the host technical centre, ranging from capital investment plan to organisational development strategy. In addition to the business results, other important outcomes were related to personal development in leadership and teamwork skills, and the creation of a learning community consisting of cross-border teams and networks. Other results in Phase I as reported by the Technical Managers included better insight on how to establish productive peer consulting relationships; appreciation of others' strengths and weaknesses, and gaining a better insight on ways to achieve synergy; and the creation of personal relationships to work together and accumulating social capital to share ideas and experiences. The areas of learning are summarized in Figure 2.

### *Phase Two Results*

One learning outcome from Phase Two occurred at the individual level with participants learning how to develop and sell business strategies to senior

leadership. At the regional team level, it deepened technical managers' knowledge of each other as team players. As a result, there were greater informal exchanges outside of the ATMLF context. At the organisational level, project results contained analyses of business opportunities and challenges from the technical perspective, and integrated laboratory planning into the site business planning process. It also facilitated a shift in the definition of the technical manager to technical leader and entrepreneur.

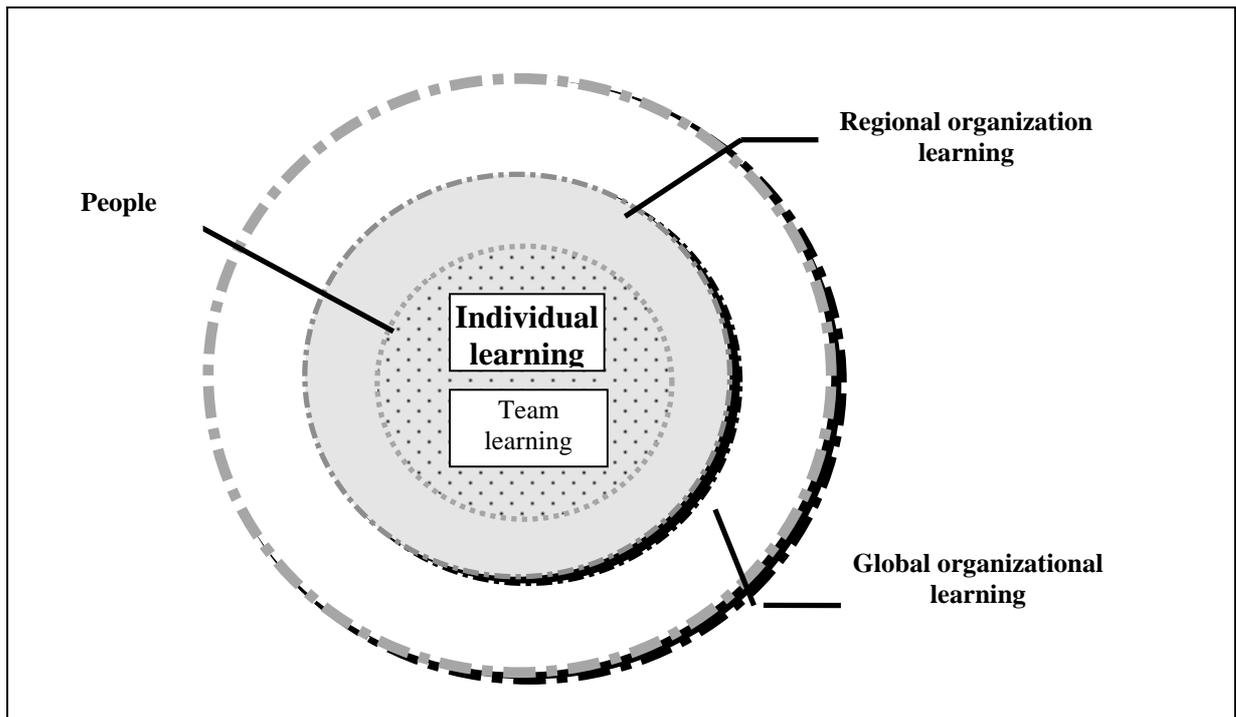


Figure 2. Inter-relations between individual and global organizational learning

By setting a new standard for the annual technical planning process and by adding a strong business development perspective, the innovation potential and business opportunities presented in each country and jointly in the Asia region could be better harnessed in the future. ATMLF provided the learning, the hands-on practice, individual coaching and peer consulting to link vision with action.

## Lessons Learned

ATMLF represents an innovative management development process and pioneered a prototype for large-scale application at 3M (Yiu & Saner, 2000; Saner & Yiu, 2000). From a learning perspective, the following points were identified and addressed.

### *Process Design*

The cyber action learning approach was initially confronted with the challenge of uncooperative behaviour on the part of a few participants. In order to

institutionalise this regional learning network, measures were put in place which for future participants:

1. *Contract for Team Meetings*. A pre-arranged bi-weekly teleconferencing was initiated to provide a concrete learning structure for participants. These virtual meetings required preparation and adoption of agenda and minutes by team members.
2. *Semi-structured Reflection Process*. Individuals were required to actively examine their own frame of references (mental models) during their action learning processes.
3. *Stronger Emphasis on Learning Journal*. Individual learning journals were encouraged for reflection and helped to counteract a tendency for fast action with programmed routine responses.
4. *Experiments*. Teams were encouraged to experiment with different forms of self-regulation in the cyberspace, such as assumption of leadership roles without necessarily being formally appointed.
5. *On-line Learning*. On-line tutorial modules and reference materials were made available for easy access.

#### *Cross-Cultural and Cross-Boundary Challenges*

To conduct action learning in cyberspace was a new undertaking at 3M. This process was made even more challenging when working with multi-cultural teams on cross-border projects. Even today, Barah, Kling, and Gray (2004) describe building online communities as a “major accomplishment about which we have much to learn” (p. 4). However, this ambitious management development process accomplished most of its objectives, primarily due to the unyielding commitment of participants. Some cross-cultural and distance challenges included:

1. *Time lags*. Team meetings, although occasionally held through video or audio conferencing, were more often plagued with slow communication interspersed with long gaps. The instantaneous feedback between sender and receiver was broken, and virtual teams needed to be highly self-regulated in order to stay on course.
2. *Participation*. In general, there was a great risk of members dropping out over time. This situation was accentuated when there was a leadership vacuum within a virtual peer team.
3. *Proximity for collaboration*. Geographic dispersion and time differences made the use of a virtual classroom a necessity and challenged the participants whose sensory inputs were dramatically reduced.
4. *Competing priorities*. Since learning projects were not part of the routine work of the Asian Technical Managers and because members engaged in learning activities mostly in isolation, it was easier to be distracted by more pressing daily tasks. Competing local priorities occasionally pushed the team project low down on the priority list.

5. *Physical Virtual links*. Conditions differed from country to country in terms of technical communications infrastructure. The challenge became how to present the information in an interesting fashion and to accommodate the logistical constraints faced by different ATMLF members.
6. *Bonding*. A shared sense of purpose was essential to sustain the cross-border virtual teams. The challenge was how to foster a sense of community amongst the participants without the comfort of physical proximity. Participants entered the virtual classroom at times that did not coincide with the schedule of their team mates or that of the teacher-facilitators.
7. *Trust*. The lack of daily face-to-face time, which offers opportunities to quickly clear the air, can heighten misunderstandings or create communication barriers within the virtual teams. The need to share high trust within the virtual teams was of significant importance due to the different cultural backgrounds of its members.
8. *Cultural diversity*. Each ATMLF team consisted of three members of three different cultural and national backgrounds. This cultural diversity influenced the teams' approach in dealing with leadership issue in a leaderless setting, in expressing disagreements, and in managing common tasks.
9. *Instructor constraints*. In an on-line environment, the teachers provided less content input, and worked more to structure the learning process and motivate trainees to stay actively engaged. They spent more energy in sustaining the group cohesion, nudging the group forward, and monitoring for social loafing.

### **Questions for Further Study**

1. How could improved technology facilitate the learning in an action learning project even further?
2. Was there a sense of community really achieved among the participants?
3. Could the approach be successfully replicated in other parts of the globe?
4. Would moving the process through an additional layer of the organization dramatically improve the effectiveness?
5. Could this be replicated in a non-business environment?
6. What are implications of technology for people for whom English is a second language?

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