

**Rapid Team Learning -
Lessons from Team New Zealand America's Cup Campaign**

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In the 144-year history of the America's Cup race, teams from outside the United States have claimed the coveted prize only twice. Australia was first to do so in 1983, marking an end to the longest winning streak in sporting history; New Zealand followed suit in 1995. Furthermore, Team New Zealand's unprecedented margin of 41 wins and only one loss in the four-month long race makes this victory unique in the annals of the America's Cup Regatta.

The success of Team New Zealand in the 1995 America's Cup campaign is well publicised. It has been acknowledged that the inspirational leadership of Sir Peter Blake, the strong sense of community apparent within the Team New Zealand camp, the openness of communication between team members, the sustained rate of boat speed improvements, and the uncommon levels of commitment and purpose evidenced by participants in the campaign were among the key characteristics of Team New Zealand's success.

This paper discusses the Team New Zealand campaign in the context of learning organisations in general and rapid learning in particular. Using Team New Zealand as a case example, we demonstrate how free flowing idea generation can lead to rapid improvements in product design and an exceptional end result, once learning processes and effective team dynamics have been established. Moreover, the paper highlights aspects of Team New Zealand's success that can readily be applied to team-oriented organisations.

We focus on capabilities of a learning organisation and the characteristics that led to rapid learning within the Team New Zealand campaign. The learning pattern of Team New Zealand is then contrasted with the conventional theories of learning curves and team dynamics. Finally, a holistic learning model is presented under the heading of The Learning Cycle. Team New Zealand's integration of people and technology is discussed in relation to this learning cycle. The implications of Team New Zealand's experience for organisations, and for new product development teams in particular, are discussed throughout the article.

Core Capabilities of Learning Organisations

The Team New Zealand campaign exhibited many traits attributed to learning organisations. From team selection through to the final race, the Team New Zealand camp was structured from a 'systemic' perspective. Peter Senge describes a learning organisation as one "which is continually expanding its ability to create its future". He identifies five core capabilities of a learning organisation that relate to three higher elements: creative orientation, generative conversation and systemic perspective.

Figure 1 shows the core capabilities of learning organisations. These capabilities are dynamically interrelated and collectively lead to organisational learning. Creative orientation is the source of a genuine desire to excel. This emanates from an intrinsic motivation and purposeful drive to achieve in order to serve a common goal. Generative conversation refers to a deep and conscious dialogue and exchange to create unity of thought and action. Systems perspective is the ability to see things holistically by understanding the interconnectedness of the parts.

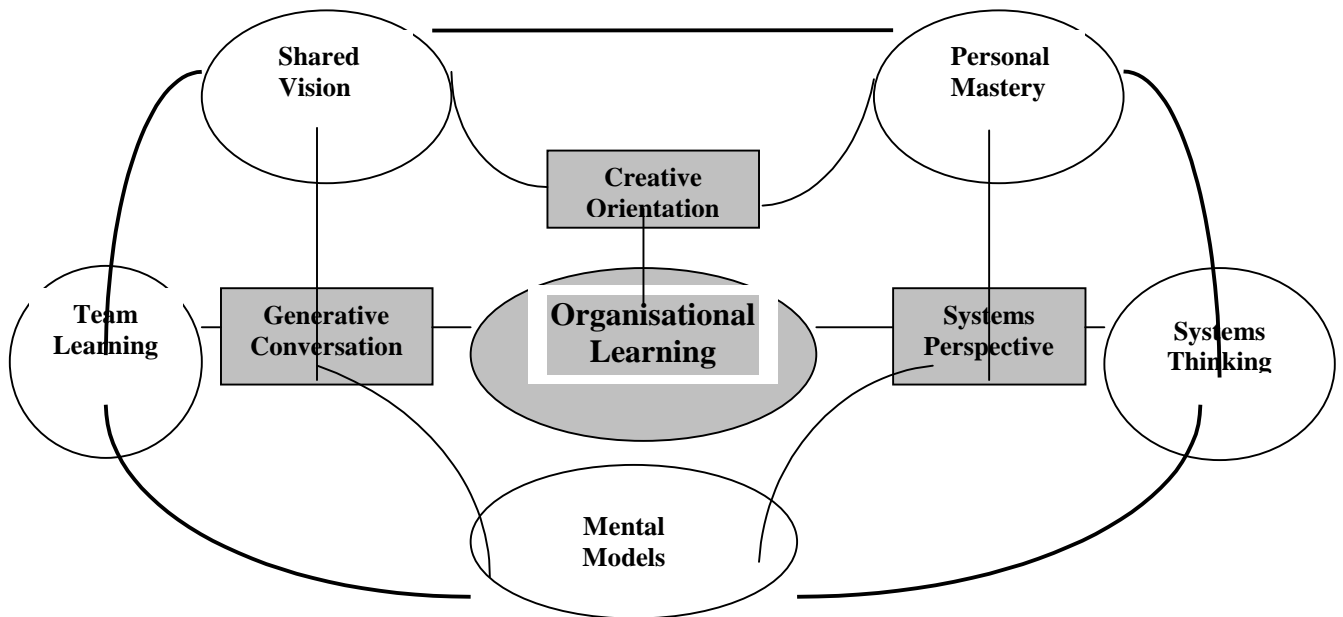


Figure 1 - The Core Capabilities of a Learning Organisation

Personal mastery is borne out of a creative orientation and systemic perspective. It is the spiritual foundation and the cornerstone of learning organisations, inculcating a genuine desire to do well and to serve a purpose. Shared vision is the outcome of a creative orientation and generative conversation. It aligns multiple and diverse views into a unified vision through a deep and uncluttered dialogue process. Mental models are the beliefs, feelings and assumptions that shape one's world views and actions. They are formed through family, education, and social contacts and are based for the most part on cultural and social norms. Mental models can be influenced and altered through generative conversation (i.e., dialogue) and systems perspective. Team learning is the outgrowth of generative conversation (dialogue), shared vision, and transparent mental models. It is the manifestation of the transcending of personal goals for the good of the whole. This occurs when a leader can appeal to the emotions as well as the intellect of the team members.

Finally, systems thinking (the fifth discipline) is the art of seeing wholes and the science of explaining complexity. It is the ability to see the world holistically. A fundamental systems thinking principle is that the performance of the system is a function of the interaction of its parts, rather than their individual excellence. Systems thinking helps to clarify mental models and is enhanced by transparent mental models.

Shared Vision

It is commonly assumed that in contemporary organisations senior management can develop and impose a vision on employees which the latter will then follow with *genuine* commitment. This is a fallacy. Imposed vision statements result in a sense of apathy and complacency and sometimes resentment. There needs to be a genuine endeavour to discern what people will commit to. To obtain commitment from team members, they must feel a strong interest, even passion, for the outcome. The overriding goal of the team must build on the personal visions of its members.

Leavitt and Lipman-Bluman describe Apple Corporation in its “adolescent” years. It was as creative as it was informal, defiant, and possessed of the moral certitude that Apple played David to IBM’s Goliath. This is similar to Team New Zealand competing against the bigger budget syndicates! There was real passion for the outcome in the Team New Zealand campaign – members were possessed by a common vision for success, almost a righteousness to put to rest the wrongs of the past.

The Team New Zealand campaign consisted of a group of individually successful people, which would, in many circumstances, lead to ego battles. This is prevalent in technical teams (eg, new product development) where members are highly experienced and intelligent people. In these settings, individualistic and ‘turf protecting’ attitudes represent the most serious threat to team performance and success. What enabled Team New Zealand members to transcend these turf protecting barriers and forge a powerful shared vision?

Team New Zealand instilled a sense of ownership within the camp. The Public Relations manager commented: “It was *their* project and everybody in the team had to own it. It wasn’t Peter Blake’s campaign, it was *theirs*”. This sense of ownership provides a powerful generative force. Personal visions were given the full range of opportunities to develop. Every member wanted to win the America’s Cup, and by instilling a sense of ‘owning the campaign’ people were energised to contribute as much as was humanly possible.

“Envisioning” is the label which Nadler and Tushman apply to the first component of charismatic leadership. By creating a vision, the leader provides a vehicle for people to develop commitment, a common goal around which people can rally, and a way for people to *feel* successful. The leader must appeal to peoples’ emotions if team members are to be energised towards achieving the goal. Emotional acceptance of, and belief in, a vision is far more pervasive in energising team members than is cognitive recognition that the vision is simply a ‘good idea’. One of the most powerful ways of communicating a vision is through the leader personally demonstrating behaviours and activities that symbolise and further that vision. By working as a crew member on the water throughout the campaign, Peter Blake implicitly instilled a vision of a sailor-led campaign in a far more compelling manner than had he simply provided lip service to that vision.

This sense of ownership is emphasised by Arie de Geus when he describes what makes a truly extraordinary organisation. "The feeling of belonging to an organisation and identifying with its achievements is often dismissed as soft. But case histories repeatedly show that a sense of community is essential for long term survival".

Mental Models and Leadership

Lewin, a pioneer in the field of the social psychology of organisations, observed that "the first step in any change process is to unfreeze the present patterns of behaviour as a way of managing resistance to change". Following team formation, the team leader has a pivotal role in disassembling negative group dynamics that can inhibit future team learning and installing ones that encourage collaborative learning. New team members had to discard any baggage from the past and become dedicated to the task at hand if the campaign was to be a success. Peter Blake was instrumental in establishing a highly effective team environment, especially given the small scale of the New Zealand yachting fraternity and the historical remnants of previous campaigns.

Because Team New Zealand was initiated from scratch, Peter Blake could mould the group norms and communication routines based on a set of common core values. Edgar Schein comments that the role of leaders in team formation is tremendous. The leader must propose the answers to the questions that the young group has about how to operate internally. Both founders and new group members will be anxious in the process of group formation and will look for solutions. The test of whether or not the espoused values work is how comfortable and *anxiety free* members are when they abide by them. How comfortable and anxiety free were Team New Zealand members as a result of the core values espoused by Peter Blake, and how did these values contribute to building a powerful team dynamic?

Peter Senge refers to the leader as a 'designer', where part of that role is designing the governing ideas of purpose and core values by which people will live. Peter Blake saw himself as a catalyst to design the governing ideas and core values by which people would coexist within the confines of the camp. He designed the core values that were instrumental in creating an effective team environment and incorporated these values into the team structure from the outset. Team New Zealand's core values included:

- meaningful communication ('dialogue')
- integrity
- everybody has the right to express an opinion.
- play nicely together and "share your toys"
- no hidden agendas

Schein states that the initial design of the organisation provides ample opportunities for leaders to embed their deeply held assumptions about the task, the means to accomplish it, the nature of the people and the right kinds of relationships to foster among the people. If values are not based on prior learning, they may reflect what Argyris and Schon call espoused values – you can predict what people will say in certain situations, but this will not be in congruence with their behaviour. For example, a slogan such as "We value quality in our products" is often not supported by quality workmanship.

Team New Zealand's core values laid the foundation that facilitated open and complete sharing of information and the high levels of honesty and trust present within the camp. For example, "share your toys" and "everybody has a right to express an opinion" encouraged everyone to freely share their ideas, irrespective of

the seeming absurdity of them. The core values expressed above are a necessary prerequisite for effective team learning (the ability to ‘think on the margin’).

If a leader cannot instil these values into the members of the organisation, and, as a consequence, let the values reflect in the behaviour of group members, then they simply become part of a vision that ‘hangs on the wall’ and bears little relation to reality. Only values that are susceptible to physical or social validation and that continue to work reliably in solving the groups problems will become transformed into assumptions about how to operate. Only once Team New Zealand members had experienced the successful application of their core values would they become the basis for prolonged group effectiveness.

Cohen and Tichy in *How Leaders Develop Leaders* allude to the need for everyone in a team to be a leader in their own right if speed of action is an imperative, as it was during the 1995 Team New Zealand campaign. Using the example of the Chicago Bulls basketball team, the authors explain how Michael Jordan changed his role from not only that of an individually brilliant player but *also* to that of a leader whose job it was to raise the level of play of other team members. After that, the Bulls began their record run of championship seasons. In previous America’s Cup campaigns, despite the presence of some brilliant individuals, a highly successful campaign did not result. Team New Zealand’s governing ideals and core values were of little use if Blake could not raise the potential of every team member in the campaign.

When an organisation is in its development phase the driving and controlling assumptions will always be manifested first and most clearly in what the leaders demonstrate in their own behaviour, not in what is written down or inferred from visible designs, procedures, rituals, and published philosophies. Cynicism spreads quickly if people do not perceive the leader as being committed. Blake had a strong sense of *stewardship* towards the Team New Zealand campaign. He made himself totally visible to the crew. The crew could see how serious he was about committing to the goal of having *the fastest boat on a given day*. Blake clearly displayed to all members of the camp that he was willing to go the extra mile. A team member stated, “We would walk over broken glass to do anything for him”. He had “a keen appreciation of the impact one’s leadership can have on others”. Having him on the boat almost completely removed the gap that normally exists between the management and crew.

This gap between sailors and management is analogous to ‘the great manufacturing divide’ (most commonly between marketing and manufacturing) in many organisations. Orders are accepted by marketing that cannot be produced within the quoted lead times, or are of specifications which will prove impossible to adhere to with current production technology. The result: excessive work in process, large lead times, frequent order expeditions and a high number of missed due dates. Blake’s harmonious relationship on the water with the team skipper, Russel Coutts, established a model for interaction between management and sailors. For example, Blake could see the validity of sailors’ suggestions for increased boat speed or claims for dry suits (which may be directly related to increased boat speed). There existed little chance of a disparity between ‘production capabilities’ and management expectations within the team, given that Peter Blake worked ‘on the shop floor’. If crewmembers needed dry suits to operate more effectively and hence add to

boat/product performance, this could be realistically evaluated from the *perspective of the shop floor* - not from financial or corporate binoculars. Blake's open management style enabled the crew to have the freedom to experiment within a tightly run campaign.

Moreover, Blake appeared to exhibit excellent inquiry skills. This attracted many contributions from the team. For example, a team manager observed:

"He'll sit in on design meetings, and although he may not understand all of what they are talking about, he asks questions and gets people to justify themselves so that correct and consistent decisions are made. However, he doesn't tell them how to design the boat".

Shell Oil has recently undertaken major changes in the way it breeds leaders. The message is designed to appeal both personally and emotionally. According to Irv Doty, who leads a unit of more than 100 people at Shell, "When I tried to talk personally about an issue rather than say 'here's the answer', it was powerful. It caused me to engage in dialogue with others that resulted in mutual learning on all sides". For Team New Zealand members to engage in searching and open discussions of issues that affected the campaign, Blake needed to appeal to people's emotions and get beyond the superficial level of discussion.

Many leaders have strong charisma and are highly eloquent when it comes to presenting their ideas; that's often why they get to the top of the organisation. However, many appear to lack the ability to extract the very best out of the employees in a non-threatening manner. Without balancing 'advocacy' with 'inquiry' a lot of very good ideas can be missed, or many bad ideas can be acted upon. The repercussions of this can be very costly in projects such as product development, where approximately 70% of the life cycle cost of the product is committed in the concept development phase.

Personal Mastery

Senge argues that people exhibiting high levels of Personal Mastery focus "on the desired result itself, not the process or the means they assume necessary to achieve that result". These people can "successfully focus on their ultimate intrinsic desires, not on secondary goals. This is a cornerstone of Personal Mastery". Personal Mastery also requires a commitment to the truth, which means "continually challenging our theories of why things are the way they are...to see more of the playing field.". When tension levels rise in a group situation, people often revert to coping strategies such as "I've got to do it all by myself because other people will let me down when push comes to shove". Without committing to the truth people all too quickly revert to old communication routines which can distort reality and prevent teams from knowing where they really stand.

Team New Zealand achieved insightful views of current reality via "a deliberate process of total communication. Everyone knew the design process, where we were looking for gains (no hidden agendas). In team meetings there existed no pecking order". Current reality was perceived from as many different angles as possible - the most insightful view achievable given the combined contributions of *all* team members was therefore obtained. They did not withhold their perceptions of reality.

There existed a commitment to the pursuit of 'truth'. Genuine trust and camaraderie helped facilitate the free flow of information and open dialogue evident in the campaign. A major learning outcome for a crewmember was "how a bunch of guys through *rigorous honesty* can achieve great results".

Team New Zealand was intrinsically aware of the need to always to keep moving forward. This enabled Team New Zealand to transcend any secondary agendas that impair group momentum (i.e. having to 'win' a place on the crew). Creating the vision of boat speed - that is, "to build, modify and sail the fastest boat on a given day" - provided the creative tension. A team member stated, with respect to designing the boat, "You've got to keep developing. If you're not making progress, somebody else is.... You need to continue a rigorous development program right up until the end".. It was acknowledged that in pre 1995 campaigns "We simply did not know how to finish - to sustain the winning edge as time progressed". In contrast, in the 1995 campaign the most dramatic increase in boat speed occurred in the last month leading up to the challenger series.

Team Selection

In any high performing team, "group performance is more than the sum of its parts". From a systemic perspective, it is the management of the *interactions* rather than the individual skills, which determines team performance. This point is emphasised by Russel Ackoff: "The fundamental function of managers is to manage the interactions of those for whom and to whom they are responsible". Peter Blake implicitly took a systemic perspective towards team selection. Blake selected a team "not purely on their skills and abilities, but on how the members were likely to *interact* with each other".

Leavitt and Lipman-Blumen coined the phrase *Hot Groups*, referring to a lively, high achieving, dedicated group, usually small, whose members are turned on to an exciting and challenging task. They mention that organisations that first devote a lot of time to selecting their people and then allow them plenty of elbow room and opportunities to *interact* are likely to generate groups that will build challenging tasks for themselves. This is paradoxical in that organisations which place more emphasis on selecting the right people than the task itself during team formation actually spawn Hot Groups that will focus tirelessly on whatever task(s) the group is presented with. This *people first* selection criteria was epitomised at Bell Telephone Laboratories in New Jersey, who have been accredited with inventing modern communication theory and a host of other breakthroughs thanks in large part to its Hot Groups.

A Team New Zealand member commented that "One of the key success factors behind the campaign was in selecting the right people - having the right people in the right areas. You could then put trust in people to do the right job". People had respect for, and confidence in, the technical ability of others. Too often teams consisting of technically excellent people, such as engineering and product development teams, mistrust each other. As a result, communication breaks down and performance falters. In previous Team New Zealand campaigns where the sailors were paired off against each other, "setting mate against mate resulted in a fractious camp where loyalty waned".

David Nadler writes, in *Beyond The Charismatic Leader*, that for a team to be successful there must be a perception of a common fate. Individuals *have to believe* that the success of the team will, in the long run, be more salient to them than their individual short-run success. Leavitt mentions that even in Hot Groups composed of markedly differing personalities, members respect and trust one another because they see themselves as highly capable people dedicated to an important task. In the 1995 America's Cup campaign, Team New Zealand members' emotional intensity was directed towards attainment of a common task rather than conflicting secondary agendas. Conflicting secondary agendas cloud team members ability to 'throw themselves' into successful completion of the task. One could infer a correlation between this antagonistic environment present in previous campaigns and the fact that there was little or no improvement in boat speed near the end of the campaign. What was different this time?

Team selection was based on a fundamentally different premise than that of previous campaigns. "The overriding selection criteria was *compatibility* - we had to be able to get along with each other under a variety of situations. This helped people trust other people's instincts, or at least understand them". However, as a team member commented: "Seldom do compatibility and ability go together. There were plenty of instances where individuals felt they could do fine without any help from their friends". As Leavitt alluded to above, personality differences are of little consequence once the right environment has been established to allow team members the freedom to attack an important task with the intensity it deserves. People focus less on the abilities of other team members and more on completion of the task. If the project takes on great significance for the team and the leader leads the project with belief and passion, then there is a reasonable chance that such a diverse assemblage can become a Hot Group.

Arie de Geus, referring to a study of the critical success factors of long-surviving and prosperous companies, stated: "Recruits should be judged as much on the basis of their fit with the companies values and principles as they are on the ability to fill the technical requirements of the job". Team New Zealand, by focussing on compatibility and fit as opposed to pure technical competence, as was the case in previous campaigns, sowed the seeds for a highly effective team environment.

Team Learning and Dialogue

"Team is a small word, but it has a huge meaning. The tighter the team, the bigger it hits". What enabled Team New Zealand to continually generate new and often diverse ideas in an environment of extreme pressure (time, cost and public expectations)? How did Team New Zealand succeed in developing effective team environments where myriads of companies have faltered and reverted back to "crowd" or "herd" behaviour typical of traditional authoritarian hierarchical organisational structures?

Dialogue is an essential requirement for team learning. It is a creative exploration of complex issues - a deep sense of listening and suspending one's own views. Dialogue centres on the ability of a group to see through meanings and words. Dialogue comes from "the Greek word *dia logos*, and literally means when a group of people talk with one another and meaning moves through them".

Team members need to elicit the best ideas in a non-threatening manner. A Team New Zealand member epitomised this in saying: "We had at least a full team meeting per month, where there existed no pecking order. For example, the girl on the reception was encouraged to express her opinions, and on one occasion she was actually closer to the mark than anybody else when deciding upon the best design configuration to enhance boat speed - she even beat the designers". This is another example of the high degree of consistency between the espoused values that Peter Blake designed and the patterns of behaviour that followed. Only when team members experience the success of these values as a method of group conduct do they become ingrained in the day to day operations of team members.

Leavitt and Lipman-Bluman state that encouragement from the leader and from one another keeps a Hot Group's heart pumping. Comments such as "Great idea! Let's keep pushing it", or "OK. So those two alternatives didn't work, so let's try the third alternative" keep the group moving forward towards achievement of the task. These comments, termed 'soft markers', are essential parts of effective group dialogue. Blake's inquiry skills, as discussed above, implicitly provided for these 'soft markers' at team meetings, helping Team New Zealand continue momentum towards achieving success.

Blake actively sought contributions from everyone and discussed *all* the possible ideas before a decision was settled upon. Unconventional solutions were sought, as these could often lead to big gains in short times *providing* they were correct. As a result, all members were encouraged to think on the margin as was evidenced by the secretary who, at a brainstorming session, contributed to and selected the best idea for increasing boat speed.

Federal Express adopted 'dialogue improvement' techniques to enhance team learning. Twenty Federal Express senior sales staff attended monthly conferences on developing learning organisations. Customers commented that these salespeople became much more attuned to customer needs, didn't jump to conclusions so readily, were more willing to hear a customer out, and understood customers' dilemmas better. The Team New Zealand camp certainly displayed these attributes. The campaign was attuned to 'customers' needs by including the sailors in the design process. Blake's ability to balance advocacy and inquiry skills - asking questions that probed people's hidden assumptions - enabled the crew to have the maximum freedom to experiment with their thoughts. These skills catalysed Team New Zealand's ability to design a product that was user friendly, of outstanding quality (fast boat speed), and within the right cost and timeframe.

Constructive feedback is an integral aspect of dialogue. In their study of Hot Groups, Leavitt and Lipman-Bluman mention that members often debate loudly and passionately about issues. They are not given to easy consensus. Personal differences need to be put aside before effective dialogue can ensue.

When people associate themselves personally with their ideas, egos become attached and defensive routines are enacted. Senge observes "A team with excellent dialogue consists of members who can separate themselves from their thoughts (ie separate ego from thought). They begin to take a creative, less reactive, stance towards their

thought...people can help each other become aware of the incoherencies in each others thought".

Schein describes a case study of a company called Action, where the familial feelings between group members were implicit and important because they provided subordinates with a feeling of security that made it possible for them to challenge each others' ideas. Within Team New Zealand "There were no barriers or personal conflicts. Guys felt very comfortable accepting criticism and saying constructive comments". How can this atmosphere be established and maintained?

GS Technologies, manufacturer of steel for mining machinery and mattress coils, uses a tool called the *container*. The idea is for people in a meeting to imagine a container that holds everyone's hostile thoughts and feelings. Any hostility can be greatly subdued as people discard their personal differences and focus on the task at hand. This enables excellent constructive conversation to emerge, as idea and ego become separated. Because Team New Zealand had a strict ethos of allowing personal ambitions but no personal agendas, a 'container' was created in which people could place their personal agendas and accompanying egos.

In most organisations not only is dissent discouraged, it is also punished and generally regarded by employees and managers alike as a "career ender". Unlearning the traditional response of denigrating dissent and learning to encourage diversity is one of the key challenges facing managers in learning organisations. If people have been denigrated in the past for challenging traditional organisational thought patterns, it is considerably more difficult to encourage openness and objective criticisms than would be the case for people who are used to more open and honest communication.

Chris Argyris refers to organisational defensive routines as any policies or actions that prevent organisational players from experiencing embarrassment or threat and, at the same time, prevent the organisation from uncovering the causes of the embarrassment or threat in order to reduce or get rid of them. Organisational routines are anti-learning and promote mediocrity. For example, a mixed message such as "Bill, be creative, but for heaven's sake, be careful!" is a defensive routine that can stifle innovative thinking. Unfreezing these routines, and understanding the powerful detrimental impact they have on collaborative learning, is a serious issue many organisations are faced with if they are to create effective team learning environments.

Rapid Learning

Today an increasing number of organisations have to deal with "critical" decisions in a rapid fashion. This both challenges and inculcates the ability to learn rapidly. Team New Zealand was operating under extreme time and budgetary pressures. Moreover, it needed rapid improvement in boat speed during this period. Because of budget limitations, design implementations had to be at the launch time. This is comparable to a manufacturing company entering the tooling phase in the product development life cycle. Undoing design moves once they were attached to the boat could easily "blow the budget". A poor design fitted to the boat could be extremely counterproductive to the campaign goal of increasing boat speed.

Rapid learning was amply manifested throughout the Team New Zealand campaign. A useful analogy to help understand the nature of rapid learning is to view the entire Team New Zealand campaign as a new product development project. Most product development teams operate under extreme time and budgetary pressures. Successful product development relies upon a close match between market needs and a company's core capabilities - mistakes are very costly once mass production/service delivery begins.

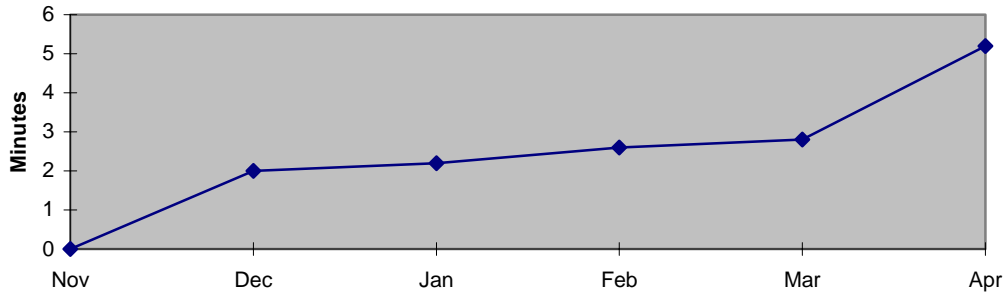
Rapid product development requires the ability to pull together ideas from both within and outside the organisation to produce innovative solutions in a short space of time. This brings to bear an important point with respect to the speed of team and/or organisational learning. Bowonder and Miyake define organisational learning as "the ability of an enterprise to observe, assess and act upon stimuli which are either internal or external to the organisation in cumulative, interactive and purposeful ways. The *nature and dynamics* of people and technology interaction will determine the speed of learning".

Maani's research shows that a critical aspect of the design process is identifying the end users and involving them in this process. Effective engineering design teams operate in this manner, where the end user of the product is included in the design process. In the case of Team New Zealand, sailors (end users) were an integral part of the design process. "To achieve a team-oriented culture, traditional management structures were tipped upside down, and the sailing team, who were the customers, were placed at the pyramid's apex". The design team worked on the above deck layout and systems with a core group of 'yachties' right up until the race day. The sailors accepted any design change that would make the boat go faster - even if it made the individual sailor's job more difficult.

In the Team New Zealand campaign it was the fluid interaction of the sailors with the technology design process that facilitated such rapid improvements in boat speed. In previous campaigns "the designer was autonomous and not receptive to outside input, making it hard for team members to become involved...his decisions were *relayed* to the crew via the campaign managers". This is akin to the conventional 'linear' design process that was prevalent before the advent of concurrent engineering. Team New Zealand experience proved "that 60 brains all contributing to the campaign are better than 1". Curiously, the design technology was comparable to the competitors' and those of previous campaigns. However, the lack of synergy between the design team and the end users (sailors) may have had a detrimental effect on boat speed improvements in previous campaigns.

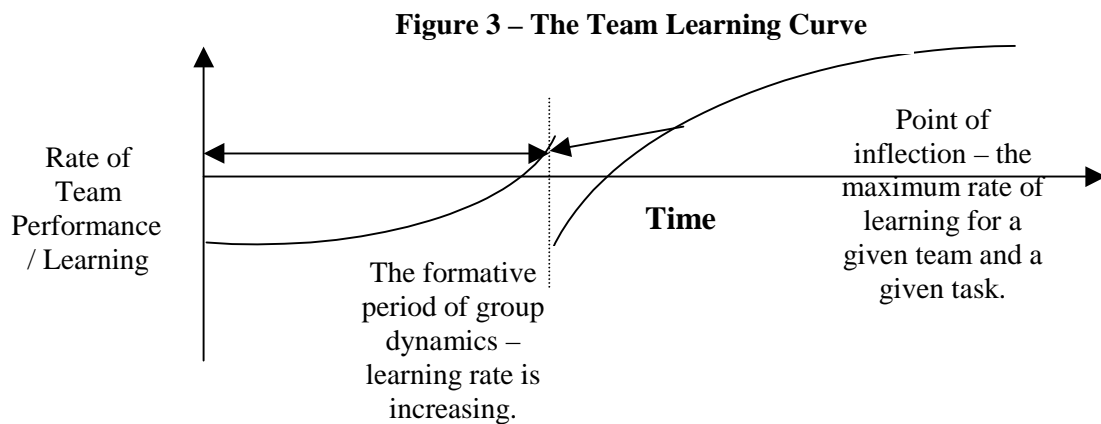
Figure 2 shows the pattern of improvement in boat speed over the final six months of the race. Significant gains were made near the end where the cumulative learning effect was at its peak. This pattern contradicts the conventional learning curve model

Figure 2 - Improvement in boat speed (in minutes) over the final six months of the challenge (used by permission from P Mazany)



(The Boston Consulting Group, BCG) which asserts that learning rate diminishes with volume of activity. This pattern, however, is consistent with Analogue Device’s cumulative learning notion based on experimentation, which maintains “the time required for each cycle of improvement is largely a function of the complexity and bureaucracy of the organisation”. This also supports Fine’s concept that firms may learn faster at high quality levels than at low quality levels. Initially, the learning rate for groups of individuals will be slower because team members have to come to terms with each other’s communication mannerisms and diffuse any personality issues that may hinder dialogue. When teams are formed, collective learning is influenced largely by group dynamics as opposed to the volume of transactions. The impact of negative group dynamics can be somewhat mitigated, however, by carefully selecting team members who are less likely to ‘clash’ with one another, as evidenced in Team New Zealand.

Figure 3 depicts the learning curve for group dynamics, with the formative period yielding an increasing rate of learning. In contrast, the logarithmic shaped curve for individual learning proposed by BCG suggests that the rate of learning continually decreases with time.



During the formative period, team members develop communication norms and routines (including non-verbal cues, etc) which can set the pattern for future group

dialogues, and hence the rate of team learning. In effect, as the team is learning how to learn during the formative period, the rate of learning is not at a maximum.

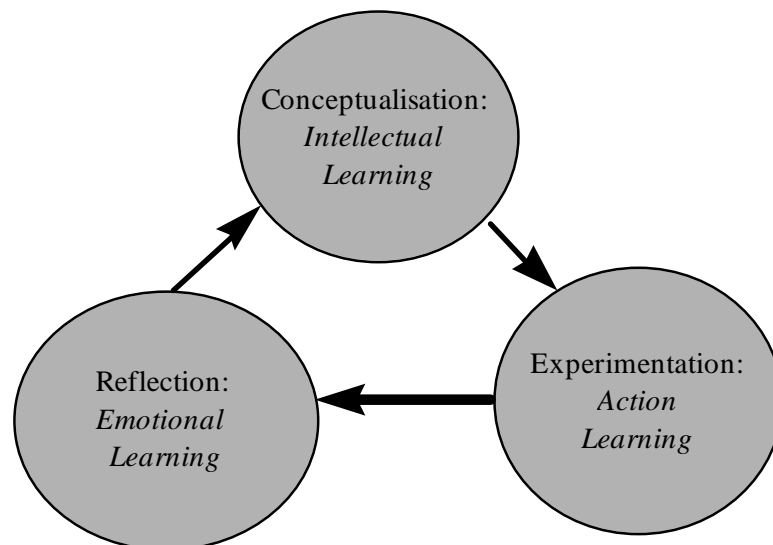
Schein states that upon team formation a proposed value or assertion, such as “share your toys”, is not yet a basis for group dialogue until group members have jointly acted upon this value and observed the outcome. The cognitive transformation occurs in the group over time, where the proposed value or assertion is transformed into a shared belief and then into a shared assumption. For example, until people have expressed radical ideas and observed that you are not scorned because of them, they will not openly “think on the margin”. Only values that are susceptible to social validation and that continue to work reliably in solving the groups problems will become transformed into deeply embedded assumptions.

Beyond the formative period, the rate of group learning can increase sharply until it reaches technological limits. At this point the learning curve will exhibit a diminishing return similar to that proposed by the Boston Consulting Group.

The Learning Cycle

The holistic view of learning embodies three complementary elements. Conceptualisation or *Intellectual Learning*, Experimentation or *Action Learning*, and Reflection or *Emotional Learning*, as shown in Figure 4 below.

Figure 4 - The Learning Cycle



Conceptualisation is the learning associated with the intellectual faculty. It deals with developing theories and hypotheses regarding the reasons why things happen as they do. Conceptualisation is also where the results of learning from experimentation and reflection get cemented or formalised (ie. The Plan-Do-Check-Act improvement cycle). Conceptualisation requires innovative and fresh thinking. Many firms are locked into standard industry practices which can be an antithesis to learning. Even popular techniques such as ‘benchmarking’ and ‘industry best practices’ fall short of learning outcomes. Being locked into ‘standard industry practices’ could well have sunk Team New Zealand.

Leavitt and Lipman-Bluman mention that Hot Groups prosper in organisations that are deeply dedicated to seeking the truth. Institutions where Hot Groups exist, such as Bell Laboratories, place a high value on the mores of science and search for the truth. These organisations welcome the chance to experiment with new ideas, and are constantly searching for ways to advance a given task.

Experimental learning refers to 'learning by doing', where new theories and hypotheses are tested in a 'laboratory' environment (ie, the scientific method). The desire for experimentation was evident in the Team New Zealand camp when they decided to launch two similar boats in NZL-38 and NZL-32. The rationale behind this decision was that it would provide the maximum amount of information and improvement over the six month 'on the water' campaign (a lot of the ideas for the campaign were tested via on board computer simulation- their 'learning lab'). "Two widely different boats would have made it difficult to draw meaningful conclusions".

The constant two boat trials are also indicative of Team New Zealand's intrinsic desire to continually improve. There would be fewer incentives to keep 'raising the bar' with respect to boat speed had the two boats been notably different, as was the case for the other syndicates.

Senge describes the concept of creative tension as the energy generated as a result of the gap between where an individual wants to be and the position that person is currently in. Creative tension is an integral part of personal mastery, and requires both an accurate and insightful view of current reality coupled with a clear vision. Team New Zealand's willingness to experiment stemmed from a constant desire to learn – a desire to generate as much information as possible with respect to improving boat speed. The two-boat campaign coupled with a constant desire to improve fuelled a powerful creative tension that drove improvements in boat speed.

Conventional testing methods are often too expensive and time consuming and inhibit short learning cycles. Short learning cycles allow a significant increase in the number and speed of design iterations and lead to rapid learning. Management flight simulators and learning laboratories are tools that significantly compress the experimentation time of the learning cycle and permit managers to 'see' the implications of policy decisions almost instantaneously.

Brown asserts "It's never enough just to tell people about some new insight. Rather, you have to get them to *experience* it in a way that evokes its power and possibility". Team New Zealand used simulation to 'experience' design changes. The designers built thousands of different boat shapes and experimented with them under the San Diego wind and wave conditions. This simulation software 'collapsed time' and enabled the design team (including the sailors) to *visualise* the repercussions of new design ideas. This process permitted Team New Zealand to build thousands of different shapes, and test them to come up with "the fastest thing on water".

Likewise, Xerox uses videos for experimentation. As an integral part of the product development of the digital photocopier, management observes videos of the product while in use. Xerox termed these videos "unfinished documents". The viewers were to complete the 'experiment' by suggesting their own ideas for how they might use the new technology and what these uses might entail for the business.

Long cycle times are a major impediment for experimentation in new product developments or policy analysis projects. Techniques such as rapid prototyping using stereolithography, for example, help to shorten the experimentation phase. Powerful CAD packages have a similar effect, although stereolithography has the advantage that the customer can actually *feel* the product and gain an appreciation of its characteristics, such as texture, that are not possible via computer mediums.

The third element of the Learning Cycle is reflection. Reflection is ‘emotional learning’ as it engages one’s feelings in addition to hard facts and cold results. It allows people to pause and think through their experiment. This is perhaps the most neglected area of the learning cycle. Too often management focuses on hard ‘data’, ignoring the emotions that are attached to this information. As a consequence, loyalties are lost and commitment to management edicts becomes superficial and at best callous.

The necessity for emotional buy in is strongly emphasised by Cohen and Tichy when they discuss Royal Dutch/Shell’s Committee of Managing Directors (CMD). The CMD launched a series of workshops designed to shock, energise and mobilise executives towards new corporate directions. Everyone participating in the workshop began the session by spending twenty minutes drafting his or her own resignations. The exercise engaged the executives emotionally. Intellectually, it was the start of them internalising a story for the case for change.

The Team New Zealand case demonstrates that the learning cycle (design, test, evaluate), assisted by simulation technology, has powerful outcomes. In order to reflect on ‘theories’ and develop new hypotheses regarding boat redesigns, Team New Zealand spent considerable time thinking and talking together. Having two similar boats, where one could in effect be used as a ‘control’, catalysed the experimentation. The improvements could then be pinned down with greater accuracy to a particular reason. Integration of simulation into the design, a test and evaluation process is effective in institutionalising learning. Constant evaluation and reflection allowed Team New Zealand to examine and review their assumptions and enabled managers to gain deeper insight into team dynamics.

Conclusion

The rapid team learning exhibited by Team New Zealand contributed substantially to their phenomenal success. The fluid interaction between the technology employed in the design process and the people involved yielded synergistic benefits for the whole campaign. Sailors’ involvement as a central part of the design process led to an exceptional product (the boat) and very quick design improvement cycle times. Companies such as Xerox provide further evidence for similar end user focused design processes, resulting in short design cycle times and continuous improvements in performance, which enables rapid experimentation with radically different ideas.

Genuine dialogue enabled Team New Zealand to move steadily in the direction of increasing boat speed. Because team members were encouraged to contribute, and an environment existed where there was no fear of expressing ‘silly’ ideas, very few ideas were missed. This provides a fundamental lesson for new product development teams. In product development, it is vital that the design team examines issues from a

360-degree view. Mistakes made after the early stages of concept development can be very costly and are often detrimental to the success of the entire project.

Organisations are often constrained by entrenched belief systems, resulting in preconceived ideas on how things ought to perform. At Xerox, for example, this realisation led to a change in design focus from isolated technology to 'technology-in-use'. *Contextual* design, as opposed to isolated design, gave Team New Zealand members the opportunity to visualise the ramifications of diverse and fresh ideas and facilitated their 'thinking on the margin'. This design philosophy helped avoid both the application of ineffective design decisions and the rejection of novel ideas that might have led to large performance gains. By using powerful animation software, Team New Zealand allowed non-technical members of the design team, such as sailors, to experience the implications of design decisions in the context of the environment for which they were intended. Team New Zealand employed the design, test, and evaluate cycle in quick successions. Additionally, because of the speed of the test phase, Team New Zealand was afforded time to reflect and isolate those variables that truly impacted the boat speed. Compressing the test phase in product development projects will allow more time for experimentation and reflection, those areas where valuable learning occurs.

Team New Zealand's drive to continually increase boat speed emanated from an intrinsic sense of mission on the part of individual members and was unified by a shared vision. A high degree of personal integrity and honesty enabled the campaign's members to obtain a clear and insightful view of where they actually stood in relation to their goals. This helped team members to transcend personal differences and ego battles, which all too often beset contemporary organisations and distort information sharing. This was in stark contrast to previous campaigns where sailors had to compete for personal objectives, such as winning a place on the boat, as well as winning the campaign as a whole.

The team's sense of ownership towards the campaign was greatly helped by allowing everyone to contribute to the process of *designing* Team New Zealand. Team members *collectively* designed the process to achieve victory in the America's Cup.

The role of the leader is central in creating a lasting shared vision. Peter Blake instilled ownership of a common vision that proved to be so critical for Team New Zealand's success. In contrast, too many contemporary organisations attempt to impose visions on their staff, whilst giving them no control over the design of the process to achieve the vision. Many managers can advocate their ideas strongly, but often this is at the expense of the contribution of others.

Blake's balance of advocacy and inquiry skills helped elicit the best contributions out of people in the design process. Blake displayed strong stewardship towards the campaign as a whole and towards the people he served. Consequently, team members felt inspired to do anything for him as they observed that he would do likewise. The early actions taken in creating a learning culture were a prerequisite before any of the rapid learning manifested in the latter stages of the campaign could come to fruition.

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