# Chapter 5

# Managing  Information: Mike Krzyzewski as CIO

*If I am through learning, I am through*

John Wooden, former UCLA basketball coach

Beginning during the tenure of Bill Walsh as head coach, San Francisco 49ers offensive coaches would pencil in the first twenty offensive plays they planned to use prior to the game. This represents about 25 percent of a team's offensive plays in a typical game.  Many coaches weaned on the San Francisco system as well some others adopted this practice such as Mike Shanahan, head coach of the two-time Super Bowl champion Denver Broncos, and Dennis Green, head coach of the Minnesota Vikings.   Of course, game situations frequently dictate deviations from the plan.  For instance, a long return of the opening kickoff inside the opponent's ten yard line would usually spur an immediate revision of plans.  Although Walsh admitted as much to a reporter by saying that "things never go as planned," he added that "sooner of later we'll come back to everything that's down [on the scripted play sheet]."[1]

At first glance, the practice of scripting so many plays before the game begins seems a bit strange.  Purposefully restricting one's own flexibility would appear to make the job of opposing defensive coaches easier.  While the practice has tradeoffs and even its advocates do not stick by

it to the letter, its main advantages revolve around the acquisition and management of information. Professional football teams enter a game with a large number of plays in their playbook from which to draw. Planning in advance to call a particular set of plays helps reduce the uncertainty for one's team. As Walsh puts it, "listing them makes me feel more secure and my quarterback feel more secure." In addition to this security blanket, drafting the plays also permits the offensive club to gather information about defensive planning and response. Of course, all teams, even those without a pre-planned set of plays, try to analyze defensive reactions to obtain important clues, but the practice of scripting plays permits this information to be gathered in a systematic, pre-planned rather than haphazard way. This information acquired during the early parts of a game can then be utilized as the game progresses.

Although pundits during the 1990s frequently referred to an ongoing information revolution, decision makers in the twentieth century did not discover the importance of reliable information. Monarchs, military leaders, and merchants from antiquity have understood the value of searching out and carefully using information. They did not require twentieth century industrialists or academics to tutor them on how informed decisions are superior to decisions made in ignorance. The late twentieth century, however, ushered in staggering technological breakthroughs in computers, electronic networks, video retrieval, and other information technologies. These technological developments dramatically lowered the costs of collecting, transferring, and analyzing information, and thereby, compounded the amount of information on hand at exponential rates.

In fact, the information explosion occasionally recast the problem into one of too much

information rather than not enough.  It also infected some managers with an addictive fascination

with information technology rather than a sensible and cost effective use of information.

Regardless of how tight budgets might be for other kinds of expenditures, information

technology expenditures often skirted through as if endowed with magical properties.  Marking

out a web presence and finding a catchy ".com" name frequently took precedence over more

serious matters as managers feared being left in the dust of information technology.  As

managers and companies have begun to learn, some more quickly than others,  information and

technological upgrades are only useful to the extent that they help to improve decision making

within an organization or better position the firm to interact with untapped customers.  Put a little

differently, the value of information to any decision maker rests in its ability to help decision

makers simplify the complexities and reduce the uncertainties of the world.  The end result is a

better foundation for decisions or to better connect with customers.  While sports managers have

not led the way in using new technology to manage and transmit information, their experiences

with information do highlight several critical features of effective management of information.


**INFORMATION, INFORMATION, INFORMATION**


In real estate, the adage for success has long been "location, location, location."  For most

sports teams as well as many businesses, information can be substituted for location as the

critical ingredient in success.  Whether in football, on Wall Street, or Main Street, managers face

a complex world.  A multitude of causes and effects occur nearly simultaneously and situations

change rapidly. In football, offensive and defensive personnel shift from play to play as do pre-play formations, blocking schemes, pass routes, offensive plays, defense schemes, position on the field, down, yardage to obtain a first down, and so on. On Wall Street, timely reports on raw material production, contractual agreements, technological developments, financial data, political developments, and other economic signals are deemed so critical that firms spend billions of dollars per year in the pursuit of this information. On Main Street, the habits and preferences of consumers, the reactions of rivals, availability and costs of materials and wholesale items, the cost of borrowed funds, and the reaction of shareholders all pose knotty and important informational puzzles not easily unraveled.

The Dallas Cowboys developed into one of the premier sports organizations of the sixties and seventies, in part because of their emphasis on information. During only their second season of operation, General Manager Tex Schramm hired a statistician to work with coaches to quantify performance factors and to use computers to record, organize, and analyze the data. The statistician paired an original set of 300 measured items down to a small set summarizing character, quickness, agility, strength, explosiveness, competitiveness, and mental alertness. Scouts used these metrics as the basis to assign grades from 1-9 to prospects. The team went so far as to search out and adjust for the biases of individual scouts in their grading. By 1963, Schramm and head coach Tom Landry began to exploit this wealth of information in drafting players and signing free agents.[2]

While sometimes reluctantly, other parts of the sporting world slowly crept into the information age. Baseball manager Earl Weaver kept compiled detailed statistics on the

performance of specific hitters against specific pitchers and vice versa.  Before his time and

even beyond, many managers simply relied on the tried but not always effective  "lefty against

righty" strategy or on merely gut feelings about situations.  Weaver recognized that a manager's

judgment still mattered but that this judgment would be better informed by meaningful data.

About the same time as Weaver, Dick Williams also pioneered a greater reliance on detailed

information about situational performances of his players.  He utilized this kind of analysis to

help guide the Red Sox to the World Series in 1967, the Athletics to a dynasty, in the 1970s, and

the Padres to the World Series in 1984.   As this kind of meticulous review of data become more

acceptable, some later managers went even further with it.  Tony LaRussa, for one, is widely

noted for his attention to organizing and studying summaries of key bits of information about

performance.  LaRussa has won pennants with the White Sox, Athletics, and Cardinals. One

writer goes so far as to call him "compulsive" in his attention to detailed information.  LaRussa

views information as not only one of his primary tools in making strategic moves against his

opponent but also in rationalizing his decisions to players.[3]  The movement toward the

information age has swung far enough that now Brian Billick, head coach of the Baltimore

Ravens, requires all of his assistants to utilize personal computers in the recording of certain

details – a requirement hard to imagine even ten years earlier, especially in the macho culture of

professional football.

Developing an organizational culture where information gathering and analysis methods,

especially new ones, are embraced is no easy task in itself.  Because it stepped so far out of line

with common practice of the sports world of the early sixties, the intensive, computerized, data-

oriented analysis of the Dallas Cowboys spawned derision from other teams, the media, and

sometimes even from Cowboy players themselves. These detractors saw the computerized

methods as an extension of Tom Landry's seeming impersonal ways and a triumph of cold

methodology over more passionate leadership. Similarly, Earl Weaver often took abuse over his

reliance on numbers. Even one of his ace pitchers, Jim Palmer, derisively referred to Weaver's

data analysis. In several instances, the use of more intensive information gathering or analysis

methods in sports took sizable leaps forward when leaders either came from outside of sports or

had at least spent some time pursuing other careers or interests. For example, Tex Schramm had

spent time working in network television in New York. During his time there, he became aware

of how computers could store and analyze huge amounts of data. Tony LaRussa holds a law

degree. Outside of sports, the same kinds of resistance to informational technology also emerge.

Workers and managers involved in the day to day operation have frequently viewed data

collection and evaluation as ivory tower edicts from detached executives. They may nominally

adopt procedures forced on them but discard such tools for actual decision making, choosing to

fall back on experience and gut feelings.

The critics of incorporating new information gathering and analysis methods often

suffered from two common problems that frequently hinder the integration of better information

collection and analysis in other kinds of organizations. First, many do not really understand the

methods employed. With limited understanding of their workings, these critics view the new

ideas as esoteric and suspicious. For example, the critics of the Cowboys viewed the

methodology simplistically as merely a fascination with or reliance on "computers" rather than

people.  They could not see the intimate link between the methods used and gaining an

informational advantage over the competition.  Unlike the poorly informed critics, Tom Landry's

background in engineering made him respect detailed data analysis rather than suspicious of it.

He quickly bought into the importance of quantifying and scientifically analyzing large amounts

of relevant data.  He recognized the advantage this information could provide to his coaching and

scouting staff.

This same problem rears up in business settings.  Often, the higher level managers'

training in data analysis may have become stale and dated in the twenty or thirty years since they

graduated from college.  They may see basic accounting or finance data as useful but be

suspicious of more sophisticated statistical techniques simply because they are unfamiliar with

them.  For information to be useful in an organization, key managers or leaders must fully "buy

in" themselves.  With the Cowboys, for instance, Tom Landry's acceptance and participation in

the data-oriented analysis made it more than just a novelty.   Even with his support, some

coaches and players would still not grasp the relevance of the methods, but without his full

support, the information, no matter how useful, would have been brushed aside as a lark of Tex

Schramm and some pointy-headed statistician.   Cooperation also increases when these tools and

their uses are not just explained to those impacted by the methods but where the relevance and

usefulness of the tools can be demonstrated in hands on ways.

The second hurdle to newer and better uses of stems from an overconfidence in one's

abilities to solve complex problems with little more than seat-of-the-pants decision making.

Experimental psychologists have documented this behavior and labeled it "cognitive conceit."

Among both sports managers and business managers, success can produce a culture of bravado where one's own gut feelings become over-valued. Promotion to higher levels of responsibility itself can sometimes breed this kind of overconfidence and contempt for more or better information.[4] The cognitive conceit problem, though, does not just strike executive-level personnel. It can run throughout all levels of an organization. It may influence players to think that they "don't need any stinking computer printouts to help make decisions." A successful baseball player, in part because of his success, may develop an inordinate amount of confidence in his ability to pick the right pitcher just based on a hunch and observation.

Probably the best way for managers to heighten awareness of this kind of problem among themselves and others is to use real examples or even borrow some of the experiments from cognitive psychologists. As a simple example, most people have considerable confidence in their ability to pick out a seeming "hot streak" whether it be by a hitter in baseball, a basketball shooter, or other situations. In fact, considerable evidence has been collected indicating just the opposite. Most individuals poorly distinguish between a random sequence and a non-random sequence. If a coin is flipped 100 times, it is quite common for sequences of several heads or tails to surface. When presented with these sequences disguised as shooting outcomes, made versus missed, rather than coin flips, it is common for people to impute "hot streaks" to these purely random sequences.

**TRACKING INFORMATION WITHIN THE TEAM**

During the 2001 Stanley Cup playoffs, Colorado Avalanche Coach Bob Hartley's practice of consulting players concerning team decisions attracted attention. In Hartley's view, a coach who does not try to gain from the knowledge of the players is foolish. Duke University basketball coach Mike Krzyzewski echoes this idea, espousing a broad view of effective communication on a team.[5] He encourages dialogue between players and views facilitating and encouraging that dialogue as part of his or any leader's job. He even goes a step further than most coaches by prompting players to speak up in timeout huddles. As he notes, "I want players to talk in the huddle because they might notice something that I cannot see from the sidelines."[6]

Hartley and Krzyzewski either consciously or intuitively understand that information resides in the minds of many different people in an organization, sometimes in large chunks and sometimes in little pieces. Some information is held in common among almost all members of an organization and carries the label public information, but some information is held by one or a few individuals – private information. Private information may include facts that, in principle, could be known by others but in reality are known only by one or a few. Skillful management of information requires institutionalizing ways to collect this private knowledge residing among team members and using it for the team's advantage. In organizational parlance, the idea of trying to extract all information relevant to decisions within an organization is called the "informativeness principle."[7]

Instituting policies that promote revelation of key pieces of private information relevant for decisions is very important but often undervalued in management decision. Many coaches, for instance, appear threatened by the notion that their players may know as much or more as

they do about some subjects. For them, suppressing rather than promoting the communication of information by team members becomes policy. Of course, these policies may not be explicitly considered. Instead, they tend to arise more or less by default as coaches may belittle attempts by players to share information or may impose such authoritarian regimes that players are afraid to offer any information. A person would be hard pressed to find a coach or manager any more "in control" of his team than Krzyzewski, yet, he recognizes that seeking out and fostering the exchange of information does not threaten his leadership, rather it enhances his team's performance. This kind of emphasis on the acquisition and use of meaningful information is mirrored by successful leaders in business. GE chief executive, Jack Welch says "learn, learn, learn." As he explains, "We soon discovered how essential it is for a multibusiness company to become and open learning organization. The ultimate competitive advantage lies in an organization's ability to learn and to rapidly transform learning into action."[8]

In contrast, fostering the spread and use of information requires that a coach or manager actively foster and facilitate an environment in line with this objective. Players must be able to see that the manager values and expects truthful revelation of information. Yankee manager, Joe Torre, recounts a conversation with pitcher David Cone during Game Three of the 1996 World Series that illustrates the importance of drawing out information. Torre needed truth from Cone about the player's condition and whether he could expect to get left-handed power hitter, Fred McGriff, out. Torre also recognized that Cone's fierce competitiveness might encourage the player to alter the truth in order to stay in the game. Torre spoke very frankly with Cone in order to motivate honesty. Although intensified because of the circumstances, Torre's, search for

relevant and honest information was not just a one-time, ad hoc appeal. He ranked "straight communication" as his third "Key to Success" and actively cultivated truthful dialogue from players throughout the season so that he felt the response from Cone, with a little extra pressure, would be accurate.[9]

Simply put, coaches and managers who cultivate the truthful revelation of important information place themselves in a position to make much better decisions. A football coach at Southern Illinois during the 1950s, for instance, encouraged his offensive linemen to report back to him with regard to whether they could handle their assigned man by themselves or whether they might need help. This kind of search for information as a basis for adjustment was uncommon in the football world, especially in the 1950s. On most teams, a player unable to block his opponent by himself would be subjected to a barrage of harsh and belittling language as if the trouble lay only in the player's desire. In contrast, the Southern Illinois coach assumed his players were giving full effort so that blocking difficulties stemmed from a mismatch in abilities. With this information in hand, he could make adjustments in blocking schemes so that the opposing player could not disrupt the offense for the entire game.[10]

Unfortunately, the importance of the informativeness principle escapes many leaders. The author played high school football on a team ranked second for most of the year in the state of Texas in its classification. The ranking grew out of a solid basis – the team reached the playoffs the prior season, boasted almost forty seniors, included several college prospects, put up offensive and defensive lines weighing in at or well above 200 pounds across the board (large for the era and classification), and enjoyed highly skilled backs and receivers. After eight straight

wins that came with relative ease to start the season, the team lost its final two games and missed

the playoffs.  No problem plagued the team more than under-utilization of talent.  Certainly, the

coaches attempted to use players to their highest valued use for the team, but as with all

managers, their evaluations fell prey to errors and biases.  To the point here, the coaches

followed the common practice of most coaches and did not develop a culture or institute

mechanisms for players to transmit vital information to coaches about the relative abilities of

other players at certain positions.  As with most teams daily practices provided players with first

hand knowledge of which players were under-valued and which were over-valued.

The problem on the high school team in restricting information occurred largely because

of tradition and lack of insight by the coaches.  However, in business organizations, maybe more

so than on sports teams, managers sometimes suppress information in order to gain personal

informational advantage.  The proverb, "information is power," is true, and holding information

closely can grant individuals within a company the ability to gain power and related benefits at

the expense of the company.  For instance, upper level leaders may utilize opaque internal

accounting methods to disguise expenditures that benefit them.  Unit managers may hold back

pertinent information from other units because withholding it may provide strategic benefits to

that manager's unit.  In athletics, such opportunistic use of information is likely rarer but not

without precedent.  A positional coach, because of a friendship or dislike of a player under him,

might misrepresent the player's performance or give the player more or less opportunity than

another player.

Eliminating the opportunistic use of information by individuals within an organization is

a difficult task.  People not only find rewards from hoarding information in their paychecks but also in power.  It comes back to the agency problem discussed in Chapter 2 – the diverging objectives of the individual from the organization or unit.  Even in organizations that institute structures and incentives and encourage the sharing of relevant information, individuals can often still gain from keeping useful information to themselves.  One tactic is to go beyond incentives that reward sharing of information and punish those who withhold relevant information.  The difficulty here is that it may be difficult to distinguish opportunistic use of information from innocent mishandling or overlooking of information.  The problem grows only worse at higher levels within an organization.  High-level managers may face near impunity for the discretionary withholding of important information for reasons of personal advantage.  In addition, it may be relatively easy to claim that the information is sensitive and strategic in nature.

The opportunistic use of information is a big part of the mix in the accounting scandals that surfaced in recent years involving firms such as Enron and auditing firms such as Arthur Andersen.  It may be true that contractual conflicts exists in situations where an auditing firm is part of a larger organization reaping big consulting dollars from the audit client.  This may lead to tension between accurate audits and attempts to hide information to keep the consulting business going strong.  Those kind of issues are interesting but aside from the main point here. Within firms such as Enron and auditing firms such as Andersen, individual executives sometimes pursue their own agendas and intentionally withhold relevant information from the scrutiny of others within their firms.  At Enron, the CEO and CFO appear to have not only been

aggressive risk takers but not inclined toward the informativeness principle. Some auditors from

Andersen – whether because of company policy or because of individual decisions – were not

inclined to push for more transparency and neither did Enron's board. As in many cases where

the informativeness principle is flaunted, the consequences caught up with Enron.

While better rules regarding corporate board oversight or audit-firm relationships may

help, rules such as these already exist. To really avoid opportunistic use of information requires

policies along with people willing to carry out those policies. The selection of people who will

be in positions to utilize information either to the organization's well-being or to their own is a

critical choice within all organizations because there will always be room for discretion and

opportunistic use of information as long as information is costly to obtain. The hiring process

may be one of the few chances that exists to put in place people who will truly implement

information-sharing policies.


**MANAGING THE LEARNING CURVE**


The AFC Wild Card Playoff game between Buffalo and Tennessee at the end of the 1999

season had been a defensive tug-of-war. With less than a minute left in the game, the Bills

scratched out a field goal to go ahead 16-15. The next play became part of NFL lore. The Bills

kicked a low "squib" kick that the Titans' Frank Wycheck fielded. He took a step or two to draw

in the Buffalo kick coverage team, wheeled to his left, and threw the ball across the field to

Kevin Dyson. Dyson caught it and ran down the left sideline for the winning touchdown.

This "Music City Miracle" involved considerable luck that everything came off just right as well as a razor-thin judgement by the officials that the pass to Dyson did not travel forward – a decision still disputed by Bills fans. While luck played a sizable role, the Titans had prepared for this contingency. Titans players note that Jeff Fisher, the head coach, is compulsive about devoting practice time to nearly every conceivable situation. One player says, "You name the situation and we'll practice it. Fair catch-free kick, intentional safety, ...".[11] Fisher understands an important premise as a manager – while luck may play a role, desirable outcomes do not usually just happen by themselves Players do not just naturally put themselves in the right places or make the right decisions. Instead, these things must be learned through realistic practice and not merely through classroom meetings.

Mike Krzyzewski repeats a motto speaking to this very point, "It is not what I know. It's what they [the players] do that really matters."[12] Albert Einstein put the same idea a little differently, "Information is not knowledge." While all athletic teams spend considerable time "practicing," several of the most successful coaches go beyond the ordinary and often mindless scheduling of practice drills. They comprehend that learning is a process requiring time and careful attention to what is learned and how things are learned. Even though the term "learning curve" has entered everyday vocabulary, many coaches and managers still do not get the point. Instead of recognizing that learning occurs along a path and that this path requires management, they treat people as if they were robotic machines into which knowledge can be programmed much like one would plug program code into a computer.

In effectively managing learning, skillful coaches do not mindlessly imitate the routines

190 190

passed down by their mentors but carefully craft  meaningful learning environments to mimic

game conditions or to develop specific skills useful in game conditions.  For instance, almost all

sports teams practice "game situations" to varying degrees, some coaches not only devote much

more time to it, but they take greater care in more realistically simulating game environments

than others.  Mike Krzyzewski follows his own advice to "plan for nuances of game situations,"

adding that "not all coaches do."  In his team's practices, faux-officials not only call fouls on

players but team and individual fouls are tracked so that players can learn to adapt their play to

the number of fouls that they have.  As a result, in actual games Krzyzewski does not

automatically pull players out of the game in the first half when they get their second foul as do

many coaches because he has confidence that they not only have a conceptual idea of what to do

but practical experience in adapting their play to the situation.  He credits his game-like tracking

of fouls during practice with his team's ability to foul less than other teams and shoot many more

foul shots.[13]  In contrast, many coaches practice without any officiating at all, permitting and

sometimes even encouraging players to engage in behavior almost certain to lead to a foul in an

actual game.  Such coaches seem to think that the behavior developed during practice will be

turned off like a valve during the game, when in reality, they unknowingly develop foul-prone

habits.

Long before Mike Krzyzewski conceived of his practice regimen, UCLA head basketball

coach John Wooden intently simulated game situations in practice.[14]  He preached, "Failing to

prepare is preparing to fail."  Yet, in his view, intensive preparation meant doing rather than

thinking.  He steered away from the use of a playbook, listing all the different sets and plays

teams run.  Instead, he preferred to get his points across bit by bit in practice accompanied

directly by the players doing these things.  He viewed 5 minutes of talk and twenty five minutes

of repetition in practice as much more beneficial than thirty minutes of chalk talk.[15]

The critical importance of learning and the necessity of managing emphasizes the flip

side of the informativeness principle.  That principle highlights the existence of decentralized

bits of knowledge across members and units of an organization and the importance of

establishing mechanisms for collecting and utilizing the information.  Effective management of

learning recognizes that central management possesses some of the useful information for the

firm, residing in the minds of a few designers, planners, or managers.  However, for this

information to be utilized effectively, mechanisms must be established that permit the knowledge

to be dispersed among members or units in such a way that the knowledge is able to influence

productivity and not just as sterile ideas.

Another consequential but commonly overlooked aspect of managing learning processes

encompasses the lessons to be learned when things go wrong.  "Failure analysis" is the label

commonly applied to this topic and comprises a small but thriving sub-field of engineering.   The

area examines the collapse of buildings or airplane disasters and attempts to construct a

meticulous autopsy depicting the reasons for the failure, helping to identify ways to avoid such a

failure in the future.  The National Transportation Safety Board's accident investigation team is

an ongoing example.  However, failure analysis is seldom examined from an organizational or

managerial perspective.  Only recently has the topic begun to appear in little bits in business

education curriculum or executive seminars as a tool for organizational learning and

improvement. As a result business managers not only obtain little training in how to analyze and learn from failures but do not appreciate its importance. Even worse, they may eschew the analysis of failures. The tragedy in this is that while most failures have some technical "point of failure" cause, there often exist deeper, managerial and organizational reasons for failures that if left unchecked, lead to future failures of the same sort.[16]

Attention to failures and problems can help a team or organization avoid what has come to be termed the "normalization of deviance" problem. The term refers to the situation where a problem develops and is recognized. However, it is ignored because seemingly successful outcomes continue to occur in spite of its existence. It is akin to the problem of incrementalism – the old frog in water that is gradually heated to the boiling point. A basketball team may get away with careless fouls for much of the season because it dominates other teams talent-wise or effort-wise. The coach begins to view these fouls as little more than a nuisance. Then, in a key game, the team plays another team that cannot be dominated by talent and effort alone. Now, these fouls become critical to the outcome of the game, but they cannot be easily controlled just by telling the players to foul less. They team has not worked on the problem. Both the 1986 Challenger disaster and the 2003 Columbia disaster have been cited as examples of this kind of failure to examine problems and rectify them.

In contrast to most business environments, learning from failures as well as successes has a rich history in athletics. Long ago, such learning developed even to the point of becoming regimented through the viewing and evaluation of game and practice film and video. When done properly, analyzing past problems is one of the best teachers. Red Auerbach learned from his

coach while playing at George Washington University that there were "only two things wrong with a mistake: not admitting it, and not learning from it."[17]  In athletics, film and video have provided a means of seeing the problem very clearly.  Krzyzewski calls it the "truth of video."  A player may not even be fully aware of unproductive habits or untapped opportunities that examining a video can highlight.  During the 2002 season, Tennessee Titans head coach Jeff Fisher used such a method to help his players correct a persistent problem of lining up offsides and jumping offsides.  He took the step of setting up a camera aimed directly down the line of scrimmage so that players were able to view their alignment themselves.[18]

As commonly employed in athletics, failure analysis has had its limitations.  Some coaches use it to do little more than belittle players, somehow thinking that junior high school coaching tactics work at any time and on any level.  In a similar way, coaches may be too quick to jump to the conclusion that a player was somehow slack in his mental attentiveness or effort.  In contrast, a legendary coach such as Red Auerbach viewed mistakes exactly the opposite – not usually arising from negligence but rather arising from a system or process that needed improving.[19]

Possibly the most common weakness of failure analysis in athletics is that among the vast majority of coaches it steers nearly exclusively toward technical, player-related issues and not toward organizational and managerial issues.  An inclination toward self-examination, especially out in the open to players, does not come easily to highly confident coaches.   Many coaches have uttered the phrase, "I take responsibility for this loss," only to mean "You players  let me down, so I'm going to work you like never before to make sure you don't let me down again."

Few coaches during a film session admit, "Here is where I made a terrible play call" or "I should have substituted differently here." In fact, many coaches may be inclined to view any such admission of culpability as weakness, inspiring players or employees to lose confidence.

Yet, outside of these high-ego, macho-laced cultures, the honest acceptance of responsibility and admission of mistakes normally comes across to others as a virtue. By contrast, the chest-thumping insistence on viewing oneself as right no matter how much evidence to the contrary builds up evidence of a serious character flaw. Certainly, employees and team members prefer competent leaders over incompetent ones. Ineffective leaders, no matter how self-effacing or honest, wind up losing the support of those they are leading even if they do maintain respect for their humanity. Nonetheless, statements such as "I wouldn't have changed anything" are just silly when any reasonable onlooker can see that a different set of decisions would have improved outcomes. It is refreshing when a Mike Shanahan, head coach of the Denver Broncos, admits that he would be crazy not to change his strategy against the Baltimore Ravens after being manhandled by them in the playoffs the prior year.

Beyond machismo, the hesitancy of coaches to evaluate openly their own failures likely owes itself to the potential consequences of failure. In sports or business, failure will sometimes lead to negative consequences for those deemed culpable. There is no changing that fact. Coaches who lead a team through two or three losing season in a row likely face dismissal, and even though most coaches like to view themselves as "stand-up guys," few desire to speed their departure. The tendency to reduce or forestall the consequences of failure will, no doubt, lead to some of the same kinds of posturing and deflecting responsibility.

The politicizing of failure can also play a role in diminishing honest evaluation of mistakes.  This is especially true outside of athletics, the analysis of failures such as the Challenger Shuttle disaster or the Enron collapse may look at organizational and managerial issues, but these investigations are often so highly politicized that the analysis may not highlight the issues that are of genuine and enduring value to decision makers who would desire to learn from the problems.  Sometimes during the analysis of a major disaster, Congressional committees, other government entities, or policy analysts and historians will examine failure stemming from decision making and organizational perspectives.  Such analyses, even when considering how to better structure institutions or incentives to avoid failures, nearly always possess an undercurrent regarding whether more or less government involvement is appropriate, who should bear the blame, and who should suffer the consequences for the blame.  These facts lead to all kinds of posturing and spinning of the facts in order to try to deflect blame.  In the end, such political posturing becomes the enemy of effective, critical examination of failures.

How can a manager reduce the haze that the politics of failure invokes?     Managers must first open their own decisions and systems that they have put in place to examination.  Next, the leaders must de-politicize communication within an organization as much as possible.  This kind of direct, plain-speaking about problems and changes is emphasized by former NFL head coach, Bill Parcells in his *Harvard Business Review* article.  While Parcells' own personal style and the culture of football may have tended more toward harsh than just direct and plain, his main point is valid.  Outside of athletics, however, such clarity is often missing.   Matters with personal, social, or political sensitive implications may be side-stepped.  Managers may

intentionally leave ambiguity in order to leave themselves "wiggle room" later on.   In addition,

other members of an organization may tend to hold back information or minimize discussion for

fear of embarrassment or recrimination.  No doubt, organizations do not operate in a social,

political, or legal vacuum.  Discussions must be tempered with regard to these "rules of the

game."  Still, within these bounds, open and plain communication with regard to problems and

concerns is vital to the effective operation of any organization.

## INFORMATION BY EXPERIMENTATION

Woody Hayes once said, "Be a pragmatist.  First, find out what works.  Then keep doing

it."[20] Bill Walsh's practice of crafting a long sequence of plays before a game squarely takes

Hayes' advice to heart and develops it into to an ongoing practice of managing information.

More than just laying out a predetermined plan for attacking team, scheming the first fifteen or

twenty plays in advance is a device for information gathering in a way that simplifies complex

situations and provides more accurate information.  The practice permits the team to set up a

series of plays intended to isolate the defensive team's reaction to a particular formation, motion,

blocking scheme, or pass route.  The idea is to hold a number of the variables on a given play

steady and isolate the particular effects of just one two things at a time.  Of course, some things

such as position on the field, down, or yardage to gain a first down are constantly changing so

that not everything can be held steady.  To deal with this, the offensive planners can devise

contingencies among their set of scripted plays that deviate based on down and yardage.

Still, the idea, in essence, imitates as much as feasible what a chemist does in a lab – focus on the effects of one or two items of interest at a time while filtering out the influence of other factors. The complexity of the world often makes things appear as though everything has some effect upon everything else. Sorting out the main, secondary, and trivial effects is by no means easy – especially if one tries to do so by just sitting back and observing. Actively manipulating the interaction of chemicals with each other and their environment while holding constant things such as temperature or humidity permits the chemists to better sort out the way things are working. Broadly speaking, these kinds of practices are referred to as experimental design. To many scientists and engineers involved in laboratory research, the principles are almost second nature. Every day, they try to isolate relationships and filter out the effects of other influences. The same principles, though, have also come to be utilized in business settings, and as the example above shows, even in sports.

Coaches or business executives trying to experiment in this way face major obstacles. For instance, the defense or a rival company does not always have to respond to the same situation, formation, personnel, or play the same way. This can create false signals from the experiment. Yet, that is one reason that a sizable number of plays, such as fifteen, is chosen. A larger sample of plays strains out some of the random noise from the rival. Also, experimentation in business or athletics often must take place during the normal course of operation and not in a laboratory, also muddying the ability to collect "clean" data.

In spite of these obstacles, in sports as well as business, analogues to laboratory experiments do take place. Practice sessions, simulated games, scrimmages, and preseason

games provide controlled environments that do not "count" toward team performance where coaches can tinker with ideas and players in ways that is very similar to the chemist in the lab. Baseball managers, for example, commonly play around with the hitting order of their lineup during spring training games. They also commonly give young pitchers more opportunities or try players in new positions during preseason.

While the experiments performed in these controlled settings closely mimic laboratory experiments and provide valuable insights, they have their limits. They are not the same as information gained during games that genuinely matter for team performance. However, collecting information through experimentation occurs even during actual game settings, although probably with less frequency than during practice sessions or preseason games. One common occurrence is when an MLB club finds itself out of the pennant race in mid-year. The manager will utilize younger players more in order to evaluate their skills and give them big league experience. This is an experiment run during actual game conditions. In another case, a manager unsure as to the abilities of a hitter in the leadoff spot might give the person a two-week tryout and see what comes about. As with the practice of scripting plays to begin a football game, the information gained is more reliable when other influences can be filtered out as much as possible.

**KNOWING INFORMATION'S LIMITS**

During football games, analysts sometimes refer to a "chart" that determines whether a

football coach should have his team attempt a 2-point conversion after scoring a touchdown (with less than a 50-50 shot at making it) or kick the usual "extra point" worth 1 point (with a nearly 100 percent shot at making it). This chart is based on the way scoring in football tends to be based either on touchdowns (6 points) or field goals (3 points). Although 2-point "safeties" sometimes occur, they are unusual events. As a result, a 1- or 2-point lead often matters little, so a coach who scores and goes ahead by 1 point may opt for the 2-point conversion so as to increase the lead to 3 points. Likewise, a team that goes ahead by 5 points, may select to go for the 2-point conversion to increase the lead by 7 points – equal to a touchdown and 1-point conversion by the other team. The same kind of logic works for teams that may be trailing in a game and attempting to catch up in the most efficient way.

The problem with relying on a simple chart showing when to go for the 2-point conversion is that it does not provide information as to another critical aspect of this decision – that is, how much time is left in the game. If trailing by 2 points after a touchdown with 20 seconds left in the game, the decision to go for the 2-point conversion is a "no-brainer." However, the same situation in the middle of the third quarter offers no clear-cut decision. Going for the 2-point conversion and failing at this point in the game alters future opportunities. For example, if the opposing team kicks two field goals, then they will lead by 8 points rather than by just 7, so that a touchdown and 1-point conversion will no longer tie the game. Managers cannot fall back on a hard and fast rule to indicate the point in a game when the "chart" should be used. In fact, across different games, this point will differ based on the likelihood of more scoring by either team. The "when-to-go-for-2" chart provides a useful tool,

but it is only useful for part of the relevant decision.[21]

This example illustrates a much broader dilemma regarding analysis and information that all managers face. On the one hand, there may be hard data and analysis regarding a problem. However this information often encompasses only a segment of the entire problem so that it is of limited value. On the other hand, only sketchy understanding or data may exist with regard to the broader elements of the problem, so that trying to incorporate all of the additional elements create tremendous uncertainty. As a result, a tradeoff is created between using solid but limited information to analyze part of a problem versus using more conjecture analysis to consider the larger dimensions of a problem.

This fundamental dilemma of real-world analysis crops up in the terminology of disciplines that study decision making. For instance, economists may use "partial equilibrium" analysis to study the effects of a regulatory change that reduces emissions of automobiles on price and consumption of automobiles. Others may attempt to identify the "general equilibrium" effects, meaning the secondary consequences on prices and consumption in related markets such as other means of transit or fuel as well as feedback from these secondary markets back on to the automobile market. The "partial equilibrium" analysis is typically much more straightforward and capable of being examined with reliable data. However, by its very nature, it may miss important external effects just, as the 2-point conversion chart misses a key component of that decision. Yet, while very sophisticated "general equilibrium" models may be built with mathematical equations and computer simulations, these are often little more than guesses dressed up in a baroque facade.

The complexity of the world requires managers to break the world down into digestible chunks and to try to analyze these chunks with logic and solid, timely information. Managers who attempt to make decisions without serious attempts to collect or analyze data or who may even hold such attempts in contempt, suffer from the "cognitive conceit" problem noted above and documented by experimental psychologists. Yet, information and logic do not form a magic elixir permitting thought-free decision making. Managers must recognize that complex decisions rarely boil down to a neat little formula into which the relevant data can be plugged and the correct answer extruded. For one thing, no amount of information, quantified or otherwise, will typically capture all of the subtleties that may arise.

How does a manager strike the right balance between a narrow but more concrete information versus broader but more conjectural information? The U.S. Naval Academy has held seminars among faculty from diverse disciplines to address these very kinds of questions. The term they use to these kinds of problems are "ill-structured" problems. Their colloquium is devoted to helping future Naval officers strike a balance between using hard tools and data while utilizing judgment to incorporate less quantifiable aspects of decisions. The colloquium draws from experts in mathematics, operations research, economics, political science, linguistics, and other fields. Beyond the Naval Academy, the study of "ill-structured" problems has grown on many campuses as people try to understand better the nature of problem solving in complex environments.

 In baseball, managers may ignore "the numbers" or rely on their "hunches." If this means that a manager insists on guessing rather than using extensive data about hitters versus

pitchers, the manager is likely to cost his team wins over the long haul. A few short run successes are possible and may reinforce the manager's overconfidence on such hunches. However, over a 162-game schedule where the manager faces similar situations over and over, the long run averages implied by "the numbers" will provide a much better guide than seat-of-the-pants guesses. After all, such guesses are really no different than guesses at the roulette wheel. A player may go home with a big win on any given occasion, but over the long haul, the house advantage wins out.

On the other hand, a manager may gain an advantage in "playing a hunch" due to a lack of reliable information. New situations and contingencies arise that do not always neatly conform to prior experiences. If the situation under consideration has only surfaced a half dozen times, then an average computed from these outcomes is based on such few trials as to give no meaningful information. For example, a specific hitter may have faced a particular pitcher only a handful of times. Under such circumstances, the manager's impressions of batter performance are likely superior to trying to tease long run averages out of short run statistics.

Another reason that information does not substitute for decision making is that a human manager possesses the ability to weigh multiple dimensions of a decision that may not be embodied in a unidimensional statistic. Hurricane forecasters, for instance, have access to equation-based simulations (models) of weather events utilizing the power of computers and widespread weather measurements. However, a variety of models exist with each one placing a little more weight on a particular measurement. The human forecasters rely heavily on the models but also use their judgment and experience to merge divergent models into a single

forecast that also draws from information that may not be fully implemented into the model. Baseball managers, even those who put much effort into the collection and evaluation of performance measurements, do much the same thing.

The "by the numbers" versus "playing a hunch" tradeoff finds its way into all kinds of decisions in business and sports. Generally speaking, it can be called the problem of "rules versus discretion." All managers – in business, sports, or government – manage more effectively if they establish policies that dictate what will happen under certain circumstances. For instance, if a baseball outfielder misses the cutoff man, he receives a $100 fine. If people do their job in a satisfactory way, they should have an idea of their compensation. Clear, rule-based policies help people affected by management decisions to make plans with some degree of certainty. Without clear-cut, rule-based policies, people are left to guess as to what the consequences of a certain course of action are.

On the other hand, no set of rules can completely foresee and specify all possible contingencies. In academics, this is referred to as "incomplete contracting," and it arises due to the dynamic nature of the world and the limits of knowledge. A baseball manager who establishes a pinch-hitting rule that never permits discretion implicitly must assume that he has figured out all possible circumstances that may arise regarding future pitchers and hitters and their performances on a given night. Clearly such an assumption stretches reality to the point of absurdity. The same is true in business. Organizations that become so procedure-based as to permit no managerial discretion are setting themselves up for problems – some small and some possibly large. For instance, air travel in the U.S. is highly procedure-based and regimented

regarding takeoff, landing, and in-flight practices for flight crews.  However, pilots are left with

discretion regarding in-flight decisions involving weather conditions.  In contrast, one snowy

night in Detroit, with all but one gate closed and planes waiting on the tarmac to disembark

passengers, the airport manager and airline managers became so rule-bound that they created

major problems.  Rather than listen to pilot request to offload passengers first and then worry

about luggage later, they stuck "by the book."  As a result, passengers waited on planes for eight

hours and more as toilets overflowed and the planes ran out of food, water, and clean diapers –

not to mention keeping passengers basically prisoners for hours on end. The problem with

discretion is that it must be used with caution.  If policies are chucked too easily, they lose their

value in reducing uncertainty.


**FACT V. FOLKLORE**


In his book, *One Knee Equals Two Feet*, John Madden relates several axioms that were

once held as gospel among NFL coaches and insiders. One widely held belief was that teams

"can't win with a scrambling quarterback.  Just about every coach thought that."[22]  As he notes,

Roger Staubach poked holes in that dictum during the 1970s.  Whatever truth the adage may

have held in bygone eras, the advent of faster defensive players and more aggressive, blitzing

schemes turned it on its head. By the 1990s, the ability to move around became a highly sought

after quality of quarterbacks.  Yet, people with pedigree as strong as former quarterbacking

legend and coach, Norm Van Brocklin, went so far as to say a quarterback should run only from

fear.

The "scrambling quarterback" axiom illustrates an important aspect of information – folklore often takes on the guise of rock-solid fact. An imperative to the effective use of information is the ability to distinguish accurate measurement from noisy information and outright nonsense. In business and sports settings, as well as in personal areas such as health and diet, managers and observers accumulate maxims and rules-of-thumb over the years. This kind of conventional wisdom develops through practical experience often by trial and error. In many cases, the wisdom passed down contains kernels of truth. The problem is that such received wisdom of this kind also passes along folklore that embodies half-truths as well as obsolete truths – ideas that may have once reflected reality but have not been updated as circumstances have evolved. For example, the ideas about scrambling quarterbacks may have been relevant in earlier eras but became less so as defensive schemes adapted. Or, it may not have ever been correct. It may have only seemed that way because individuals with great running ability like Staubach had never been given a chance to show the idea wrong.

A prime piece of sports wisdom that has taken on the status of ironclad fact is the dictum, "defense wins championships." While many coaches and media analysts across a variety of sports invest this phrase with near scriptural importance, nowhere is it trumpeted more than in football. Even when the phrase is not being stated verbatim, it seeps out of the edges of statements. For instance, a *Sports Illustrated* writer discussing Jimmy Johnson's decision to go to the Dolphins and turn down an offer from Tampa Bay, added, "If Johnson were a prophet, he would have seen that a defense-oriented team with a caretaker quarterback could get farther than

a superannuated team with a Hall of Fame quarterback."[23]   The clear implication of the writer --

defense wins.  More recently, in analyzing the NFL playoffs in January 2002, new Dallas

Cowboy and highly successful NFL coach, Bill Parcells, said "Opposed to high-scoring games

that you saw last week, you will see a little bit of tighter struggles. The defenses are now in these

games with Tampa and Philadelphia ready to go, and Oakland played pretty good defense at the

end of the year. You will see a little stronger defensive effort, and that is always *the key to

championships is the ability of teams to play defense* [emphasis added]." Yet, the facts show that,

at best, the view that a defense-oriented team would perform better than one with a great

quarterback is based on an obsolete fact.

Table 5.1 displays the winners of the American Football Conference (AFC) and the

National Football Conference (NFC) every year since the teams from the old AFL merged with

the NFL in 1970.  Beside each winning team, the team's offensive rank and defensive rank

within the Conference is shown based on total points scored and total points allowed during the

regular season.  Overall, 11 of the 31 AFC champions finished with higher ranking defenses than

offenses, while 18 finished with higher ranking offenses than defenses.  In two seasons, the ranks

were equal.  The NFC also crowned 11 champions with higher ranked defenses, 12 with higher

ranked offenses, and 8 with equal ranks.  In recent years, the "defense wins" maxim falters even

more.  Since 1990, only 5 of the 22 champions between the two conferences had a higher ranked

defense.  Super Bowl champions are also identified in the table by an asterisk, supporting the

same conclusion.  Only 10 of the 31 Super Bowl winners had a higher ranked defense than

offense, while 15 had a higher ranked offense than defense.

**Table 5.1**

**Offensive and Defensive Ranking of Super Bowl Teams Since 1970**

(Ranked by Points Allowed or Scored within a Season)

| Season | AFC Team | Rank Offense-Defense | NFC Team | Rank Offense-Defense |
|---|---|---|---|---|
| 2000 | Baltimore | 7-1 | New York | 7-2 |
| 1999 | Tennessee | 3-10 | St. Louis | 1-2 |
| 1998 | Denver | 1-4 | Atlanta | 2-2 |
| 1997 | Denver | 1-3 | Green Bay | 1-5 |
| 1996 | New England | 1-6 | Green Bay | 1-1 |
| 1995 | Pittsburgh | 1-5 | Dallas | 3-2 |
| 1994 | San Diego | 2-3 | San Francisco | 1-4 |
| 1993 | Buffalo | 4-1 | Dallas | 2-2 |
| 1992 | Buffalo | 1-8 | Dallas | 2-3 |
| 1991 | Buffalo | 1-9 | Washington | 1-2 |
| 1990 | Buffalo | 1-4 | New York | 9-1 |
| 1989 | Denver | 3-1 | San Francisco | 1-2 |
| 1988 | Cincinnati | 1-6 | San Francisco | 4-5 |
| 1987 | Denver | 2-3 | Washington | 3-4 |
| 1986 | Denver | 5-5 | New York | 3-2 |
| 1985 | New England | 7-2 | Chicago | 1-1 |
| 1984 | Miami | 1-5 | San Francisco | 1-1 |
| 1983 | Los Angeles | 1-7 | Washington | 1-5 |
| 1982* | Miami | 6-1 | Washington | 6-1 |
| 1981 | Cincinnati | 2-7 | San Francisco | 5-2 |
| 1980 | Oakland | 3-5 | Philadelphia | 4-1 |
| 1979 | Pittsburgh | 1-3 | Los Angeles | 5-5 |
| 1978 | Pittsburgh | 4-1 | Dallas | 1-1 |
| 1977 | Denver | 8-1 | Dallas | 1-5 |
| 1976 | Oakland | 3-5 | Minnesota | 3-1 |
| 1975 | Pittsburgh | 4-1 | Dallas | 3-4 |
| 1974 | Pittsburgh | 4-1 | Minnesota | 2-2 |
| 1973 | Miami | 3-1 | Minnesota | 6-1 |
| 1972 | Miami | 1-1 | Washington | 3-1 |
| 1971 | Miami | 2-1 | Dallas | 1-4 |
| 1970 | Baltimore | 1-2 | Dallas | 7-4 |
| | | | | |
| Median 70-00 | | 2-3 | Median 70-00 | 2-2 |
| Median 90-00 | | 1-4 | Median 90-00 | 2-2 |
| Median 80-89 | | 2-4 | Median 80-89 | 3-2 |
| Median 70-79 | | 3-1 | Median 70-79 | 3-3 |

Table 5.2 provides a different twist on similar data by summarizing data for the most highly ranked offensive and defensive clubs within each conference each year.

**Table 5.2 Summary Season Outcome for Top-Rated NFC and AFC Offenses and Defense by**

**Decade**

| Ranking | In Playoffs | In Championship | Champion |
|---|---|---|---|
| #1 Rated AFC Offense | | | |
| 90-99 | 10 | 7 | 7 |
| 80-89 | 8 | 5 | 3 |
| 70-79 | 7 | 5 | 3 |
| #1 Rated AFC Defense | | | |
| 90-99 | 9 | 2 | 2 |
| 80-89 | 9 | 3 | 2 |
| 70-79 | 10 | 8 | 7 |
| # 1 Rated NFC Offense | | | |
| 90-99 | 10 | 10 | 5 |
| 80-89 | 8 | 10 | 5 |
| 70-79 | 10 | 6 | 4 |
| #1 Rated NFC Defense | | | |
| 90-99 | 10 | 5 | 2 |
| 80-89 | 10 | 4 | 4 |
| 70-79 | 9 | 6 | 5 |

For both the AFC and NFC, the number of times that the highest ranked scoring offense reached

the playoffs, advanced to the Conference Championship Game, and advanced to the Super Bowl

is shown by decade.   From these data, one could mount a small argument for the importance of

defense over offense during the 1970s as 12 of the best defenses across both conferences won

conference championships to only 7 of the best offenses winning conference championships, and

14 of the best defenses advancing to the conference championship game versus 11 for the best

offenses.  Much of this is attributable to the early 1970s when great defensive squads such as the

1972 and 1973 Dolphins and the 1974 and 1975 Steelers dominated.  However, during the 1980s

and 1990s the numbers reversed themselves.  By the 1990s, excellent offenses dominated.

During this decade, 12 of the best offenses won championships and 17 advanced to the

conference championship game, compared with 4 and 7 for the best defenses.  Table  5.3

reinforces these results, showing the performance of the best ten offenses and defenses since

1970.  Again, great offenses dominated the 1980s and 1990s, reaching eight Super Bowls and

winning six. Great defenses were more common in the 1970s.  Since 1970, only three of the best

defensive teams reached the Super Bowl with each winning.

**Table 5.3**

**Performance of NFL's Top 10 Defenses and Offenses Since 1970**

(Ranked Relative to Median Points Allowed or Scored within a Season)

| Team | % of Median Points Allowed | Result | Team (year) | % of Median Points Scored | Result |
|---|---|---|---|---|---|
| Rams (75) | 47% | Lost NFCC | Rams (99) | 177% | Won SB |
| Colts (71) | 48% | Lost AFCC | Vikings (98) | 177% | Lost NFCC |
| Ravens (00) | 50% | Won SB | Rams (00) | 175% | Lost NFCW |
| Vikings (71) | 50% | Lost NFCD | 49ers (93) | 164% | Lost NFCC |
| Steelers (76) | 51% | Lost AFCC | Redskins (91) | 158% | Won SB |
| Steelers (75) | 52% | Won SB | 49ers (94) | 158% | Won SB |
| Vikings (70) | 54% | Lost NFCD | 49ers (84) | 156% | Won SB |
| Falcons (77) | 56% | No Playoffs | Bills (91) | 155% | Lost SB |
| Bears (85) | 57% | Won SB | Denver (98) | 153% | Won SB |
| Titans (00) | 57% | Lost AFCD | Packers (96) | 152% | Won SB |

Source: National Football League, *NFL 2001 Record & Fact Book* (New York: Workman Publishing, 2001).

Notes: Season ranking relative to median is within each team's conference.  SB = Super Bowl.  AFCC, NFCC =

Conference Championship; AFCD, NFCD = Divisional Playoff; AFCW, NFCW = Wild Card Playoff.

Instead of the "defense wins championships slogan," a more accurate formula for winning championships would be stated as, "teams with solid offenses and solid defenses win championships."  As the NFL game evolved over the 1980s and 1990s, one could legitimately claim that great offense and good defense won championships.  To be sure, a few defense-based

teams with mediocre offenses excelled, such as the 1990 New York Giants and the 2000

Baltimore Ravens, but these were the exception rather than the rule.  Even a great defensive team

such as the 1986 Chicago Bears also led the league in scoring offense.  Although the 2003 New

England Patriots played very good defense during the season, they won the Super Bowl in an

offensive shoot-out with another defense-minded club, the Carolina Panthers.  A rebuttal to these

numbers might be that great defenses contribute to offense not only by scoring points themselves

but by creating turnovers and short fields for the offense.  While it is true that offensive output is

not independent of defensive performance, this reasoning works the other way also.  Great

offenses help their defense by keeping the ball away from the opposing offense and by pushing

the opposing offense deeper into their own end to start their drives.

Another common example of errors and myths in sports information is they attribution of

"streaks" or "momentum."  Players, fans, and the media are quick to impute a "hot streak" to a

shooter who hits several buckets in a row, to a batter who has had an above average hitting

streak, a golfer who hits several birdie putts, or to a goalie who strings several good games

together.  Likewise the hitter who is "mired in a 3 for 30 slump" is experiencing a cold streak,

and the shooter who misses several shots in a row has gone "cold."  It may well be the case that

teams or individuals find themselves in "the zone" on occasion.  The problem is that many

observers a much too quick to impute a streak where the outcomes may be indistinguishable

from random and very ordinary variations around a given value.  For instance, in a sequence of

ten coin flips with a 50 percent chance of a head or a tail, a run of ten heads in a row is unlikely

on any given set of 10 flips, but becomes very likely over a series of 1000 sets of 10 flips.

Similarly, a golfer who, on average, one-puts 7 greens during eighteen holds, will have rounds with 10 or more one-putts and rounds with 3 or fewer one points. These outcomes do not reflect streaks, per se, but usually just random variation around the average.[24]

Investors and analysts frequently make these same mistakes in tracking the behavior of stock prices. The likelihood of a given stock price going up or down over a day or month is very close to 50-50 – in the U.S. the likelihood has been slightly in favor of going up. Although this is true, a chart showing the movements of a stock price over hundreds of days or many weeks often displays movements that look strikingly like up-trends, downtrends, and sometimes cycles. However, the apparent patters are usually only a mirage. The same kinds of movements can be generated on a computer where the outcomes are forced to have a 50-50 chance of moving up or down.[25]

Business management has been a fertile ground for all kinds of folklore about effective decision making. One classic example is the quality movement embodied by and pushed by Edwards Deming. Deming is mentioned here not because he was some fly-by-night management quack. Those kind of people are easy targets. Rather, Deming was a serious thinker with serious ideas. However, whether because of his fixation or the adulteration of his ideas by others, management concepts and practices that represented food for thought and useful tools started to be peddled as gospel. In particular, the phrase "quality is free" became a mantra for the movement. Under special circumstances where a firm is underutilizing its resources to a great extent, productivity gains can be found by instituting Deming-inspired procedures without giving up much. Over the long haul, though, quality along with the methods to improve process

require expenditures that require giving up some other budget item at least in the short term. Many firms flocked to these quality-enhancing methods to find initial improvements but then experienced great difficulty in sustaining the improvements. The movement lost steam in the 1990s. In fact, the whole Japanese economy, which had been touted as the proof of these methods, stagnated in the 1990s.

The adoption of folklore as the way to manage a business runs the gambit from strategic-level ideas all the way down to personnel level decisions. It incorporates sound ideas garnered from serious people like Deming all the way down to the management-guru-of-the-month who landed on the *New York Times* bestseller list. Michael Porter, an eminent Harvard business economist, pushed the idea focusing on business strategy, the structure of competition in one's market, and not getting caught "in the middle" between quality and volume. Like Deming's contributions, Porter's ideas were serious but took on a life that far exceeded their value.[26] Other ideas acquired large followings but had much less going for them such as thinking that success was all about writing a really good mission statement, pursuing diversification through conglomerate mergers much like diversifying a business portfolio, and benchmarking. The lesson for managers to learn is to be wary of accepting the wisdom about managing without careful scrutiny. Even very successful and intelligent people fall prey to fiction that they begin to believe is fact. After all, Bill Gates once said "640K ought to be enough [memory] for anybody."

**REPLAY**

1.  Better information makes any manager better whether in sports or business.  Coaches such as Bill Walsh and Mike Krzryweski prime examples in sports of the importance and use of information.

2.  No individual possesses all the relevant information within an organization. Organizations and teams foster the sharing of relevant information shared up, down, and across units and individuals make the most use of the information.  Mike Krzryweski's Duke teams have built this kind of culture.

3.  Information is required for increased learning and knowledge, but it is not sufficient to ensure learning and knowledge.  Not all coaches transfer the knowledge in their heads to player performance equally.  Managers must structure environments that convert information into usable knowledge.

4.  Learning from mistakes is not a mere cliche, it is common practice of successful coaches and managers.   To help the team the most, learning from mistakes must become  a consistent practice.

5.  Experiments provide a wealth of knowledge to scientists as well as to coaches.  They can do the same for managers who possess the insight and creativity to utilize them.

6.      Knowledge and information are dynamic.  Rules-of-thumb and longstanding practices

may arise for legitimate reasons but may have become obsolete as the "defense wins

championships" mantra illustrates.  Reevaluation of knowledge and practice is important

**Notes**

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1. See Paul Zimmerman, "Armed for the Playoffs," *Sports Illustrated*, 55 (December 21, 181), p. 18.

2. See Tom Landry (with Gregg Lewis), *Landry* (Grand Rapids: Zondervan, 1990), p. 151-152, for more detail.

3. Leonard Koppat, *The Man in the Dugout* (New York: Crown Publishers, 1993), relates more detail about the use of information by baseball managers including LaRussa (p. 357) and Williams (p.322).

4. See Max Bazerman, *Judgement in Managerial Decision Making* (New York: Wiley, 2002) for further discussion. Also, a *Wall Street Journal* editorial draws this analogy to the Enron episode. See Holman Jenkins, "How Could They Have Done It," *Wall Street Journal*, August 28, 2002.

5. Mike Krzyzewski (with Donald Phillips), *Leading with the Heart: Coach K's Successful Strategies for Basketball, Business, and Life* (New York: Warner Books, 2000), p. 68.

6. Krzyzewski, *Leading with the Heart*, p. 73.

7. See James A. Brickley, Clifford W. Smith, and Jerold L. Zimmerman, *Managerial Economics and Organizational Architecture* (Chicago: Irwin, 1997), Chapter 12 for a more complete

discussion of this principle.

8. See Robert Slater, *Jack Welch and the GE Way* (New York: McGraw-Hill, 1999), p. 96.

9. Joe Torre (with Henry Dreher), *Joe Torre's Ground Rules For Winners: 12 Keys to Managing Team Players, Tough Bosses, Setbacks and Success* (New York: Hyperion, 1999), p. 74.

10. One of the author's colleagues at Western Kentucky University, Richard Cantrell, provided this information from his firsthand experience at Southern Illinois University.

11. See M. Silver, "Miracle Worker," *Sports Illustrated* (January 17, 2000), p. 35.

12. Krzyzewski, *Leading with the Heart*, p. 85.

13. Krzyzewski, *Leading with the Heart*, p. 94.

14. John Wooden with Jack Tobin, *They Call Me Coach* (Chicago: Contemporary Books, 1988), p. 113.

15. Wooden, *They Call Me Coach*, p. 107.

16. See www.wku.edu/~brian.goff/Complex_Problems.htm for an overview of failure analysis applied in organizational settings.

17. Red Auerbach (with Ken Dooley), *MBA: Management By Auerbach* (New York: Wellington Press, 1991), p. 189.

18. From *www.yahoo.sports.com* September 11, 2002.

19. Auerbach, *Management by Auerbach*, p. 189.

20. From Bruce Brown, *1001 Motivational Messages and Quotes for Athletes and Coaches* (Monterey, CA: Coaches Choice, 2001).

21. Harold Sackrowitz, "Refining the Point(s)-After-Touchdown Decision," *Chance*, 13 (Summer 2000), pp. 29-34, provides an informative overview of some of the statistical issues that compound the difficulty of finding the optimal decision.

22. John Madden (with Dave Anderson), *One Knee Equals Two Feet* (New York: Jove Publications, 1987), p. 55.

23. See J. McCallum, *Sports Illustrated*, 92 (April 10, 2000), p. 47.

24. Dispelling or at least shooting big holes in such streak explanations has become quite common among a set of cognitive psychologists starting with Daniel Kahneman. For a readable example, see Donald G. Morrison and David C. Schmittlein, "It Takes a Hot Goalie to Raise the Stanley Cup," *Chance*, 11 (Winter 1998), pp. 3-7.

25. The classic exposition of this is given by Burton Malkiel, *A Random Walk Down Wall Street* (New York, W.W. Norton, 2003). Malkiel, who has spent time in the Ivy League and on Wall Street has mischievously tricked many a Wall Street "chartist" with graph that seemingly depict

hot and cold streaks for a stock but are nothing more than a series of random ups and downs.

26.  See Michael Porter, *Competitive Strategy*, New York: Free Press, 1980, and Michael Porter, *Competitive Advantage* (New York Free Press, 1985).  A critique is offered in John Mickelthwait and Adrian Woolridge, *Witch Doctors: Making Sense of the Management Gurus* (New York: Times Books, 1996), Chapter 7.