Leadership and Information Technology

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Abstract

The hard skill of information technology is one that cannot be ignored in an ever-communicating world. This chapter will focus on some developments in the field of IT that leaders, whether savvy in that regard or not, need to be aware of. Some advantages and pitfalls of IT implementation will also be reviewed.

Keywords: Leadership, information technology, reflective mindset, analytical mindset

IMPORTANCE OF THE IT SECTOR

The importance of the IT sector in current times cannot be overemphasized. All we have to do is look at the market capitalization of large public corporations of the world. According to the Financial Times Global 500 list, market capitalization of the 5 largest firms at the end 2009 and 2014 was as follows[1]:

Table1 Financial Times Global 500 Market Capitalization - 31st Dec 2009

Rank	Company	Bil US$
1	PetroChina	353
2	Exxon	324
3	Microsoft	371
4	Industrial and Commercial Bank of China	269
5	Walmart	204

While there was only one IT company in the top five companies in 2009 ranked on the basis of market capitalization, the corresponding figure by 2014 is three out of five. Even if market capitalization changes on a instant-by-instant basis, the figures given here speak of the importance of

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[1] Source: http://en.wikipedia.org/wiki/List_of_public_corporations_by_market_capitalization accessed on Feb 12th 2015.

Table 2 Financial Times Global 500 Market Capitalization - 31ˢᵗ Dec 2014

Rank	Company	Bil US$
1	Apple	647
2	Exxon	391
3	Microsoft	383
4	Berkshire Hathaway	371
5	Google	330

IT companies. With the proliferation of mobiles, ubiquitousness of cloud computing, importance of social media and the emergence of new business model innovations, the IT sector continues to grow at a furious pace.

CHANGING CONTEXT FACING IT LEADERSHIP

Firms that belong to the IT industry or IT-dependent industries have increasingly more knowledge-dependent development work to deal with. Most of such work is targeted towards managing complexity that arise from within the firm or outside it. To compete effectively in the market place firms require to handle complexity so that overall effectiveness and efficiencies are enhanced. Complexity can bring about uncertainties in what to expect. Complexity may be in the form of dynamic technological changes, competition between technologies that makes investment in specific technologies risky, shortage of manpower talents, short gestation periods for introduction of innovations etc. Uncertainties can be exacerbated by the extent new forms of social skills that are called upon from IT professionals to achieve enterprise success.

Some of the new technologies that have a significant impact on the way business is done are

a) Cloud computing: Systems that are based on cloud computing requires a constant supply of innovations to keep the respective technologies current and running.

b) Teleconferencing and telecommuting: These technologies are transforming sectors like education and publishing that offer tremendous opportunities. Successful adoptions of new technologies require

considerable new learnings by not just vendors, but also users whose education may have to be initiated by the firm.

c) New automation techniques: New automation techniques that would bring in ready to use modular systems achieving enterprise-wide end-to-end systems automation.

d) New organizational innovations: The new technologies bring in changes in the the way business in done. They may demand changes in organizational structure, processes and style of management and leadership.

e) New institutional ecologies: Rapid changes in technology also brings about changes in the structure of the industry. Some new industries may be born and some may die. For instance, e-commerce is an industry has emerged recently. Similarly some industries may die when services hitherto offered by it has no more value on account of new technology. Older firms will be forced to shut shop unless they are willing to change. New types of organizations that offer specialized services too may emerge to cater to the new forms of service requirements.

The dynamic changes brought about by the above challenges have to correspond to firms' strategies that may be expressed in terms of whether they are consolidating their markets or expanding, whether retaining markets or innovating markets or whether they are creatively participating in new pan-industry ecosystems. Thriving in the midst of such changes require different forms of leadership qualities.

IT LEADERSHIP

In addition to IT companies, we can also find the importance of IT in non-IT companies, especially where knowledge component is high (Nonaka, 1991)' . Companies in the e-commerce sector, manufacturing companies with extensive supply-chain networks, educational institutions and publishing houses, companies with high R&D component in their activity profile, news providing industry and others all have shown an increasing attention to IT related activities. Commensurate with such a phenomenon we can say that IT leadership refers to leadership in companies that are in Pure IT and those sectors that are enabled by IT, IT-enabled verticals or IT intensive sectors.

Considering the convergence of IT and other IT-intensive sectors (Singh & Raja, 2010), leadership abilities that result in the effectiveness in the two sectors, whether IT or IT-intensive, turn out to be more or less the same. In highly dynamic environments, the skill sets required may changes dynamically. In such dynamic contexts what provides the continuity and flexibility to change and prosper? According to recent research the answer is mindset. With the right mindset comes the ability to marshal the right skill sets that suit the context (Kennedy, Carroll, & Francoeur, 2013; Thamilavel, 2011).

What is the mindset that ensures effective leadership? An interesting framework is provided by Gosling and Mintzberg (Gosling & Mintzberg, 2003)' . Leadership of the IT firms require require mindsets different from those of traditional industries because for the most part the managers are dealing with knowledge workers. To be effective, a systems views (Senge, 1994)' is a necessary condition not just for the leader alone but also for everyone else in the company. A leader in the IT industry has to ensure that everyone participates creatively in delivering value to the customer and this requires the right dynamics within the organization, quite different from the traditional command-and-control orientation. Such a systemic leadership is constantly looking for changes in the factual, social temporal in the system ((Pinnow, 2011 that includes not just the organization but also its environment including the stakeholders. So what we can see is that the manager or the management team has to have the mental skills to work on different dimensions at the same time. In fact these are more than skills. They border on attitudes or dispositions. For further discussion on this we adopt Gosling and Mintzberg's idea of Mindset (Gosling & Mintzberg2003).

LEADERSHIP MINDSETS

According to Gosling and Mintzberg (2003)' a balance of five kinds of mindsets is required for successful leadership or effective managerial functioning. These mindsets have to be often mutually complemented one with other, often reconciled and at other times treated as trade-offs. The authors point out that all these mindsets may not reside in one individual. Earlier we said that It leadership is required in not only It companies but also IT enabled verticals. The following diagram illustrates

the above point. Additionally the diagram also show the different kinds of mindsets that are we alluded to.
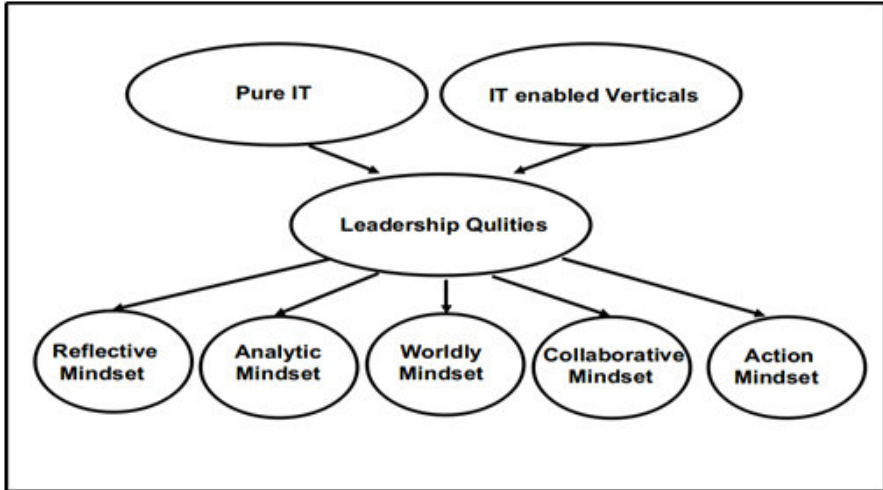
Before explaining the five mindsets (Reflective, Analytic, Worldly, Collaborative and Action) in greater detail, it is important to point out that this approach is a definite departure from managerial or leadership theories of the past. For instance, classical Fayolian theory of managing consists of five functions that goes step-by-step from one to the other in the following order: a) Forecast and plan, b) Organize, c) Command or direct, d) Coordinate and e) Control. Gosling's and Mintzberg's five mindsets are neither linear step-wise stages to be covered nor are the various mindsets mutually exclusive. The five mindsets have to be balanced, mutually reinforced and cleverly marshaled for the situation on hand.

The authors caution that the Mindset model does not follow the usual conventions of the list of mindsets being collectively exhaustive nor being mutually exhaustive. The mindsets may be complementary and overlapping that need to be creatively crafted based on the situation brought together.

In the following sections we describe in greater detail the five mindsets. Under each of the mindsets we also provide examples of key IT leaders who display the qualities described. It would not be incorrect to say that the strong leadership dispositions these individuals have provided may have been a keen factor in the successes of their respective organizations.

However, it would be patently incorrect to say that, a leader described below under a certain mindset lacks on other kinds of mindsets. As Gosling and Mintzberg caution us, each of the mindsets quality is a necessary condition. In other words, leadership consists of providing all the mindsets in abundant measure. These could be some trade-offs on some occasions. But leaders overcome trade-offs and use imagination to combine and complement what may otherwise seems as trade-offs (Wright, 2000)'. Again, the idea of picking a leader from the IT sector is only to illustrate the point.

The Reflective Mindset

Reflection has two parts. The first part consists of the process of mentally going over what has already happened or mentally re-experiencing what has already been experienced. The next part involves giving explanation to why the course of events took the turn they took. Gosling and Mintzberg see reflection "to be that space suspended between experience and explanation, where the mind makes the connections". Reflection is going beyond introspection. It involves turning inwards to reawaken to the outside in a richer, more complete fashion. It may be noted that reflection enhances the quality of experience and gives the leader the ability to learn from experience so that successful experiences can be reapplied and unsuccessful ones can be used to avoid failures in the future.

While it is not possible to exactly know how these processes happen to individual leaders we can see reflection is important for IT leaders. IT leadership has to constantly deal with changing technologies where uncertainties are higher. IT leadership also has to contend with knowledge workers with varying levels of expertise and knowledge where they may possess more expertise than the IT leader in a given domain, the ability to reflect and learn from past experiences can come very handy. In the domain of knowledge and knowledge workers, the possibility of developing Standard Operating Procedures in an operational sense has its own limitations.

The following Table 3 explains briefly the five mindsets

An IT leader like Eric Schmidt is a good example to understand the reflective mindset. Such individuals are likely to be highly educated, typically with a PhD. Often times the junior colleagues may find such

Table 3 Five Mindsets

Mindset	Managing What?	Qualities Displayed
Reflective	Self	Open to new ideas, deep learner, patient, able to negotiate between divergent interests, sees virtue in pluralism
Analytic	Organizations	Alive to organizational realities; identifies the right talent and makes the right role assignments, sets targets and coordinates the various activities to achieve desired results
Worldly	Context	Highly explorative, highly alive to market conditions, knows who the customers are or would be and potential customers very well identify markets and being situationally alive to external realities
Collaborative	Relationships	Excels in negotiation and has ability to create positive sum games
Action	Change	Aware of change possibilities; Strong will to act

persons difficult to understand. Youngsters who are revving up to go and fond of immediate action may even find such leaders rather too slow and removed from action.

In the case of Google, in 2001, under the guidance of venture capitalists, Larry Page and Sergey Brin brought in Eric Schmidt to head the company.

The investment community had presumably found the founders, Page and Brin rather too green horned to head a promising public corporation which would later go for initial public offering in 2004. Investor wanted more stability than what the founders were able to provide. Brought into Google from Novell where he was the Chief Executive Officer, Schmidt was earlier at Bells Lab where he completely rewrote Lex which is the standard lexical analyzer generator for Unix systems. Schmidt had also worked with Sun. Schmidt considered to be very approachable, a keen listener and given to charity with moderate views on privacy and net transparency issues. He could combine the business end with personal aspirations of himself and the people he worked with.

Ken Thomson – reflective Ken Thomson – reflective google now?

The Analytic Mindset

The analytic mindset understands the complex dynamics of how members of the organization work together and create results. Such a mindset provides the leader with the understanding of how the objectives of the organization can be fulfilled with the given resources. There is also need to decompose the projects into simpler components, understand where talent resides to successfully undertake the various tasks and fulfill given responsibilities. Based on this understanding the leader assigns the roles to individual members or groups within the organization. The analytic mindset keenly comprehends how the various individual tasks come together to create collective results. In doing this the IT leader would seek the help of various tools to manage the sequence in which various tasks are to be performed, allocate resources and schedule the tasks to make timely overall delivery.

As Gosling and Mintzberg point out, the "organizational structure itself is fundamentally analytic". It is after all a means to decompose the whole project into separate tasks and make assignments based on the principle of division of labor. It also indicates who would report to whom. While these are obvious issues covered by the analytic mindset, it also is able account for complex issues where there are no one good "algorithmic" solutions to the issue faced. What comes to mind is Here there is need to go beyond conventional analysis or "merely running the numbers" and getting deeper into the analysis where multiple viewpoints are accounted for. In such deep analyses, the analysts start questioning the basis their

initial iterations and redraw their reality representations and generate more sophisticated workable solutions.

A good example of a fine analytic mindset is Bill Coughran. Besides the technical abilities he was a good organizational man who could spot the right talent and assign the right people to do complex jobs. He is a technical man who understood the importance the people and the organizational systems to facilitate the smooth working of technical people assigned to different products of Google such as Google's infrastructure used for search and advertisements. He was also into Google video, security and systems. The ability to assess people, get the structures, systems and processes ensured the success of the products or rather absence of failures. Putting the right people in the right places and seeing the big picture is his forte. While in Google he was deeply involved in a number of Google products such as Chrome, YouTube and Maps. While in Google its Engineering organization from a few hundred to over ten thousand across the world. Coughran considers himself a "technologist specializing in large-scale computing and networking systems with general management experience". Currently he is Sequoia Capital as partner assessing, advising and investing.

The Worldly Mindset

The worldly mindset is alive to the market conditions and is cleaver in knowing what the customer wants. Such a leader is explorative, without being foolishly obsessive about the one's own or the firm's capabilities. He or she knows what the customer wants and is keenly attuned to the needs of the market. This quality ensures that the leader is keenly attuned to understanding the market forces so that survival of the firm is not in jeopardy.

Bill Gates could figure out the mood of the market. Gates belonged to a family was of lawyers. His mother was on the board of IBM. Understanding law and conventions was part of this make up. Of course, in addition he was a dreamer and a tinkerer but a certain realism was part of his makeup. He understood that the user and the socio-cultural environment in the countries where Microsoft operated. For instance, different versions of windows were prepared for different parts of the world in line with the sensitivities of the countries or regions where it sold its products. Despite the legal family background Bill Gates know

how to be flexible when it came to taking on copyright infringement issues in different geographical contexts. It is interesting to contrast how Microsoft worked as opposed to how Sun Microsystems did. Sun Microsystems required a lot of license tests before any installation and this was getting irksome to the users. Bill Gates made it easy for people to use MS system. He reached out the common man. This also created a situation where Windows could be copied easily. It would not be wrong to say that the company did not bother too much about copyright violations, the attitude was "if you cannot pay, go ahead and use and pay later when you can". This down-to-earth view allowed the company to create a strong Windows foundation. While he knew the law, he was not overly legalistic. The practice of law is after all different from theory.

Marissa Meyers, a computer major from Stanford, is a aesthete who understood what the world required. Her legendary technical skills never came in the way of knowing the mind of the customer. She is a legend who fought to keep Google homepage cluster-free. She argued that simplicity was of great importance. There is something of the Japanese simple elegance in her way. Aesthetics required complexity being hidden the consumer. The importance of this cannot be understood unless we compare it to Myspace and Yahoo... too many options and distractions and things flashing in one place. Meyers understood people outside the technical world very well. After all she had to balance between the interests of the consumer and the advertiser.

The Collaborative Mindset

Anyone strong on the collaborative mindset would typically be called a people's person. He or she knows that there are too many areas that requires specialization and all knowledge and skills do do not reside in one person. The person with a strong collaborative mindset excels at negotiation and always seeks positive-sum games. He or she is adept at making other people feel good and knows the value of teamwork. In any organization, such a leader is hugely liked by peers, just as much as by those vertically above or below. Mintzberg, quoting Japanese colleagues says " that a truly collaborative mind-set does not involve managing people so much as the relationships among people...". Such people have patience and are good listeners. They have the ability to be in the "other person's shoes" and view the same reality from multiple points of view without

getting paralyzed by the complexity involved in such complex view.

In the IT world, Laszlo Bock is a good example of a highly collaborative person. He is Google's Senior Vice President of People Operations. Many believe that Google has changed the rules of the game when it comes to HR function thanks to people like Laszlo Bock. According to Laszlo grades don't matter and says that "hiring is the most single important people activity in any organization." His book "Work Rules: Insights From Google That Will Transform How You Live And Lead" has gives a cult status. He exhorts everyone in Google to become a founder and asks tells that "Just as larry and Sergey ladi the foundation for how Google treats its people, you can also lay the foundation for how your team works and lives". While individual excellence is tapped, nurtured and made to express itself superior products and services, Google is also very high on teamwork.

Perhaps, a discussion on the collaborative mindset cannot be complete without the mention of Richard Stallman. Outside the corporate world, he is often considered disruptive for his dissenting view of software licenses. Richard Stallman is the originator of Software Freedom Movement. In 1985 he started the Free Software Foundation which, the quintessentially open source of all knowledge, Wikipedia, describes as that movement to "promote universal freedom to study, distribute, create, and modify computer software". Stallman went on to contribute enormously towards the open source benefits all societies enjoy today. The list of benefits that arose from Stallman's philosophy would be endless: whether we talk of the universally available GNU-based Operating Systems such Linux or open sources of information like Wikipedia.

The Action Mindset

Action Mindset is about the will to act and harnessing emotions to get things done things. This may often appear to come at the expense of reflection and thinking through complex situations. Gosling and Mintzberg exhort leaders to mobilize resources and energy around areas where change is required while maintaining things that require continuity. They maintain that a Cartesian "a" causes "b" approach that depends too much on planning and structure oftentimes do not work because the messy environments in which actions take place are unpredictable and

problemmatic. Preconceived notions of how systems should work and produce results may often make the manager rigid and inflexible. In such cases, the primacy of action and the power of action mindset is readily apparent.

Sheryl Sandburg, the COO of Facebook is a good example of the action mindset. Excelling and most often topping in studies whichever school or college she attended, she taught aerobics in the 1980s while still in school. She later went on to do do her undergraduate studies at Harvard College and MBA at Harvard Business School. She was brought into Facebook in 2008 which saw some major changes there. By 2010 Facebook, which had shown losses in the years preceding 2010, started on a solid path of profits. Sandburg was tasked with Sales,marketing, Communications, Human Resources, Public Policy and Communications. Married with two children, her husband (Dave Goldberg who died in May 2015) and she were practitioners and activists for shared earning/ shared parenting marriage or what is called peer marriage. She was the principal author of the book, "Lean In: Women, Work and the Will to Lead" that exhorted a more equitable society where men and women shared the responsibility of home and earnings. One of her famous quotes is "A truly equal world would be one where women ran half our countries and companies, and men ran half our homes".

We would like to offer the case of Steve Jobs as another example in action orientation. The legendary inventor, entrepreneur, dreamer and doer rolled into one restlessly drove himself and others around him. He was so action oriented that even the company he founded and nurtured thought it fit to fire him for his change orientation, later of course, to bring him back as it advisor who later on went on to become its CEO again. The saga of Steve Jobs bringing Apple from near bankruptcy to profitability in 1998 is like a most keenly found war that he handsomely won in the end. By the end of it all he had overseen the development of everything from Lisa to Macintosh; iMac to ipods; itunes to itunes stores; and iphones to ipads. Steve Jobs was passionately hands-on and action oriented.

CONCLUSION

As cautioned earlier, the objective of treating the topic the way we did was only a explanatory tool. This equally applies to the illustrative examples we have given here. While the above treatment of the mindsets would convey that human mind or mindsets are, in reality, decomposable, nothing can be further from reality.

It must be noted that we are treading on a very complex issue to be so clinically dissective. The purpose of the article is to convey what constitutes leadership in IT that students of IT should aspire for. That all these qualities are important is quite clear. For instance, without a strong action mindset, there is no way a person can successfully lead an IT organization. In the IT field we have observed that there are too many ways to achieve a certain objective. For instance, scheduling of activities could be done in different ways. There is always learning involved. Hence there is no limit to the extent of consultation (requiring a strong collaborative mindset) and yet things need to be completed in a stipulated time (action mindset). Similarly, if the reflective mindset simply carries the mind away from reality (worldly mindset) nothing can be achieved. The task of the manager would be cleverly combine the reflective and the worldly mindsets.

Since the activities that comprise value-chain additions in the IT industry cannot have the same "rigid" structure as a conventional production process, it is impossible to separate thought from action. So there is really no place for someone in the IT industry who merely thinks, pontificates and instructs (only reflection and no action). For someone used to the traditional industrial mass production setup, the typical collective mood in an effective IT firm can be quite unsettling. Meetings are called at short notice; the "boss" gets up and goes around to others who belong (or not belong) to his team; people come in and leave the office at odd times; there are no fixed times for anything. The key learning from observing the IT leaders is numerous: Become self-disciplined, be willing to set deadlines oneself, have an eye for constant learning, bring deeply appreciative the contribution of others to the task or enterprise on hand, appreciate mutual respect, encourage diverse skills to achieve one's objective and learn to harmonize disparate skills and attitudes.

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