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Engineering Education with Soft Skills & Innovations:

A way of Transformation towards Progressive Professional Career

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Abstract— **In today time of high technology and innovations in the field of engineering only hard skills don't serve rather soft skills like communication skills, leadership skills, team work, patience, adaptability etc. are also required to get a good job, to remain stable in the job and to get ahead in the career. Without soft skills the survival is not possible. This paper mainly discusses the role of soft skills in making engineering career. Apart from this we have discussed the role of soft skills in Mechanical Engineering, Manufacturing Engineering, Civil Engineering and Software Engineering. Lastly some suggestions have also been given in the last of the paper that will help in overcoming the obstacles that come in the way of soft skills. This paper is mainly based on secondary data collected from various research papers, articles, websites and magazines. However some primary data has also been discussed in this paper. The primary data has been collected with the help of face to face interviews and telephonic interactions done with some learned persons especially engineers.**

***Index Terms*—Career, Communication Skills, Engineers, Leadership, Soft Skills, Team Work.**

I. INTRODUCTION

The typical picture of a working Engineer a generation ago would have been: Someone tinkering with his tools all by himself. Engineering was then considered a more 'localized' job that needed only technical skills. With the advancement in technology and communication, the scope of Engineering has widened. MNCs in the Engineering domain have grown leaps and bounds, and this has made cross-cultural collaboration an integral part of day-to-day work. In such an environment, today's Engineer undoubtedly needs soft-skills (to handle interpersonal relationships) apart from his core expertise (technical skills) for survival at work. Soft skills have more to do with who people are, rather than what they know. As such, soft skills encompass the character traits that decide how well one interacts with others, and are usually a definite part of one's personality. Whereas hard skills can be learned and perfected over time, soft skills are more difficult to acquire and change. The soft skills required for a doctor, for example, would be empathy, understanding, active listening and a good bedside manner. Alternatively, the hard skills necessary for a doctor would include a vast comprehension of illnesses, the ability to interpret test results and symptoms, and a thorough understanding of anatomy and physiology.

II. MEANING OF SOFT SKILLS

Soft skills are character traits and interpersonal skills that characterize a person's relationships with other people. In the workplace, soft skills are considered a complement to hard skills, which refer to a person's knowledge and occupational skills. Sociologists may use the term soft skills to describe a person's "EQ" or "Emotional Intelligence Quotient," as opposed to "IQ" or "Intelligence Quotient."

According to **Cambridge Dictionary** Soft Skills is defined as people's abilities to communicate with each other and work well together.

According to **Collins English Dictionary** Soft Skills are defined as desirable qualities for certain forms of employment that do not depend on acquired knowledge: they include common sense, the ability to deal with people, and a positive flexible attitude.

III. WHAT EXACTLY ARE SOFT SKILLS

Naresh Narasimhan, Country Marketing Manager, Tektronix, says, "In the 21st century and going forward, three things are important—ability to communicate an idea visually, ability to have a balanced point-of-view on key issues and ability to convert ideas to results." The concept of soft skills is not limited to just plain communication skills but it also includes aspects such as people skills.

Dr Pallab Bandyopadhyay, Director-HR, Citrix India, explains: "In the broader context, soft skills would also include negotiation, decision making, reasoning and problem solving, and conflict-resolution skills required in today's work environment."

"While technical professionals are often selected and trained based on measurable talents and skills such as knowledge of OS or software programming skills—which are prerequisites to starting a career in engineering and technology—intangible skills such as language proficiency, ability to work with global teams and

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positive attitude often count in making their career a rewarding one. These intangible skills are classified as soft- skills," adds Sudhanshu Pandit, Director-HR, Symantec India. When evaluating a candidate on soft skills, HR professionals look at not only his ability to communicate his thoughts clearly and concisely but also his personality and problem- solving skills.

Defining soft skills, John Prohod-sky, Founder and Principal Consultant, Future Envisioned, says, "Soft skills are non- technical, interpersonal and communication skills required by an engineer to successfully solve problems and apply his technical skills."

Throwing light on how soft skills are directly proportional to one's personality, Rajesh Choudhary, HR Head, Xilinx India, says, "Personality traits such as common sense, optimism, responsibility, integrity, attitude and behavioral competencies that include analytical thinking, result orientation and achievement, communication, teamwork, conflict management, customer orientation and attention to details come under soft skills."

As soft skills cover all the aspects related to human behavior, Zubin Rashid, Managing Partner and Head of Training, ZRINDIA, believes that "Just as hard skills teach us about domain-specific skills like technology, products and processes, soft skills are about interacting with people with whom you work."

Every company looks for a different mix of skills and experience and it is not enough just to be a subject matter expert. Communication is an integral part of soft skills.

Surinder Bhagat, country HR head, Freescale Semiconductor, India, says, "Soft skills can also refer to a set of skills that determine how one interacts with others in a way that the company as such gets represented well. These skills are applicable to all internal as well as external forums where employees are making key interactions." Tina Vas, vice president-global HR, Collabera, says "Simply put, soft skills have more to do with who we are than what we know." Soft skills critically impact the way an individual translates his expertise across to his team and further to the whole organization. Ramana Vemuri, VP-process and operations, Cigniti Technologies, believes that soft skills enhance an individual's interactions, job performance and career prospects. According to him, emotional intelligence is the critical element that defines the core of soft skills a person is equipped with.

IV. SOFT SKILLS IN INDIA TODAY

According to a recent report by employability assessment company Aspiring Minds, 56 per cent engineering graduates in India lack soft skills and cognitive skills. Non- technical aspects of engineering such as communications, relationships, temperament, emotional intelligence and risk management make a difference between success and failure. Understanding and adapting to the working environment is just as crucial as getting the job itself. Prohodsky says, "Engineering is the application of hard sciences to solve real problems but what they rarely teach in colleges is that engineering, in addition to being a technical activity, is an economic activity and, most importantly, a human activity." According to him, the ability to understand company and work team culture is the most under-appreciated soft skill. Bhagat says, "As companies become more global, soft skills are highly desirable and required in more positions now than ten or even five years ago. You may have an excellent knowledge base in engineering or technology, perhaps even a PhD, and maybe bilingual but if you have not developed good skills in communicating, interacting and people resource management, you have already limited your opportunities and chance of success." Vas adds, "Networking is also important; engineers need to keep in touch with alumni as well as industry experts via various interactive forums to understand the ground realities better." Why you should continuously improve your soft skills "Soft skills are applied emotional intelligence and as such, they are very important. As engineers, we are taught to think and apply the logic of math and science. However, we are being ruled by emotions," says Prohodsky. Soft skills are very essential for personal and professional development of individuals. "In today's economy, it is even more important considering a significant portion of Indian GDP comes from services sector. To support this growth in services sector, organizations require talents who possess greater soft skills along with hard skills," notes Rajesh Choudhary. "Technical skills may take you to the doorstep but it is your soft skills that will open up the door for you," believes Dr Pallab. Adding on the growing importance of soft skills in today's world, Vemuri says, "They (soft skills) are in demand than ever. Increasing possibility of interactions with global peers, customers, virtual teams and cross-cultural discussions mandate employers to look out for fine-tuned, polished workforce." "Soft skills facilitate efficiency and effectiveness at work," says Sunil Pathak, HR director, Cadence Design Systems. While flawless technical expertise is the primary necessity, soft skills are imperative to ensure high-quality contribution and delivery. Pandit explains, "An engineer might be excellent at writing code to solve a particular problem but unless he possesses soft skills, he would neither be able to understand the problem faced by a customer nor explain how his suggested method makes the best fitted solution for the customer's problem." Dr Pallab believes that soft skills are as important as technical skills due to two main factors: "One is that employees are being sent on projects to international locations, where they need to articulate their thoughts and actions to become productive. Second, with enhanced globalization, virtual communication has taken a front seat in today's organizations." An engineer is rewarded
for his ability to make decisions, manage risks and creativity. Therefore soft skills are vital for an individual to get employed and grow in an organization.

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Myth Buster

Myth 1: It is the hard skills (technical skills) that get you a job, not soft skills. Truth: You need to balance both.

Myth 2: Being strong in analytical aptitude, quantitative expertise and information-gathering ability is enough to fetch a job.

Truth: In addition to the above, you need strategic thinking, written and oral communication skills, leadership skills, and adaptability.

V. OBJECTIVES OF THE STUDY

1. To study the concept of Soft Skills.
2. To know the need of Soft Skills and Innovations in engineering career.
3. To study the concept of Hard Skills and Soft Skills.
4. To study the Civil Engineering and Soft Skills.
5. To study the Mechanical Engineering and Soft Skills.
6. To study the Manufacturing Engineering and Soft Skills.
7. To study the Software Engineering and Soft Skills.
8. To study the soft skills that an employer wants.
9. To offer useful Suggestions regarding Soft Skills and Innovations in engineering career.

VI. MOTIVATION OF RESEARCH

Motivation, in general, is essential in pursuit of every activity. There is 99% perspiration and 1% inspiration in motivation. Since, research involves hard labor, persistence and perseverance; these traits can be undertaken only under spirit of motivation. One has to remain internally impelled to pursue knowledge, be patient with difficulties and be ever optimistic to explore and reach some new horizons in the process of research. We personally felt motivated under guidance of our teachers who encouraged us to pursue knowledge for knowledge sake with full interest and thereby enjoy the thrill of research. Our inner urge has always pushed us to remain engrossed in studies and achieve some worthy position in the field of education and research.

VII. RESEARCH METHODOLOGY

The research methodology used in this paper is purely based on research work. This includes data based on primary and secondary sources. Secondary sources include various research papers, news papers, professional journals, magazines, text books and various websites. Primary data was collected with the help of personal interactions, telephonic interactions with the learned people.

VIII. NEED OF THE STUDY

There is no doubt about the fact that the hard skills are an absolute essential for an engineer to perform his job diligently and efficiently. The fact that the second skill set, that is, the soft skills along with the hard skills are an absolute essential for growth of an engineer in the organization. A blend of both is what determines your level of success as a professional. Soft Skills are what are termed as people skills or interpersonal skills. These determine an engineers attitude towards his work, organization, clients and colleagues. Soft skills are not just limited to the workplace of a professional but extends to other spheres of his life too for example social and family. Soft skills is not just about communicating, but includes ability to manage stress, ability to organize, ability to provide solutions.

Most of the times the importance of soft skills is ignored and not given adequate attention for engineers. The education that goes in to make an engineer does not concentrate on the people skills. The curriculum tends to ignore the fact that at the and of the day an engineer would be working in a team, reporting to someone, taking reports, dealing with work pressures, giving presentations, attending phone calls, sending mails just to specify a few. In all such situations along with technical skills, experience and physiological maturity of an individual is going to play an important role.

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IX. HARD SKILLS VS SOFT SKILLS

Hard Skills are easy to identify and define with respect to a particular profession. These are the technical skills that are associated with a respective profession. For example in the case of a mechanical engineer the hard skills would be the personnel's ability with machines, for a software engineer it would be his or her proficiency level with a programming language.

Let's take another example of software engineers. They need to be skilled in software development and testing to be able to build, test and provide support for the applications developed by them. However, to do that successfully, they need to work in a team and interact with team members to provide the best products and services. Any misunderstanding or strife between team members would result in products and services that would not be of the highest standards. Computer programming in many languages is a hard skill, whereas problem solving and communication are soft skills. Soft Skills are not that easy to define. Soft skills are also referred to as people skills as these are the skills that determine a person's interactions and dealings with coworkers. Examples of soft skills are ability to think critically, leadership skills, attitude and motivation to specify a few. "There are key differences between hard skills and soft skills but both are important and ideally complement each other," says Choudhary. "It's like IQ vs EQ. Soft skills use the emotional centre (EQ), i.e., the right brain, whereas hard skills use the logical center (IQ), i.e., the left brain." Dr Bandyopadhyay says, "In today's corporate world it is no more an 'either or' proposition. Striking the right balance between technical and behavioral skills is the key to one's personal and career success. Weighing the importance of the two may largely depend on the role in question."

X. CIVIL ENGINEERING AND SOFT SKILLS

According to a **successful real estate investor Barbara Corcoran** following are a few reasons why soft skills for Civil Engineers are so important:

A. Business Development: Only track record and a good resume of successfully completed projects may look stunning on glossy marketing pieces, well-written proposals, or a high- end website. One may have delivered all the projects ahead of schedule and under budget while maintaining impeccable quality. But in developing new clients, one should be able to

build a trusting and genuine relationship where the client actually likes you, the odds of landing a new client are slim.

B. *Career Advancement:* Taking the concept beyond just winning new clients, the development of soft skills and relationship building skills are crucial to the advancement of one's career whether you are a starter, or Project Manager fighting to break out of the chains of middle management. In these cases, let's look at applying the soft skills to the people you surround yourself with. At this point only soft skills work wonders. One may be the most creative, on-point, civil engineering design expert, but if unable to communicate, you will not be able to succeed.

C. Team Building: As a successful Civil Engineer one also requires to be a good team leader. As a leader, one needs to build trust with and really get to know the team members…both as professionals and as individuals. One should definitely take the time to learn what motivates the team member, what drives them, what they enjoy doing outside of work, where they want to take their careers, and then build bridges accordingly. Sitting behind a closed office door all day may allow an civil engineer to get things done, but that short-term success/instant gratification will ultimately force the team to crumble beneath.

XI. MECHANICAL ENGINEERING AND SOFT SKILLS

According to Barb Schmitz a successful mechanical engineer should have following soft skills:

A. Think like a businessman*:* A mechanical engineer should think like a typical businessman. In today's time as we are passing through the world of innovations companies a are looking for the mechanical engineers who can get fully involved with strategy and planning and know their way around a balance sheet and income statements. Young mechanical engineers need to understand how to calculate the total costs to produce the company's products and how it affects decisions.

B. Think outside discipline*:* Now the times have gone when one had to go to college or university to study mechanical engineering. Even in Mechanical Engineering field complex products often contain software and

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related electronic components. So one should be aware about all the new softwraes and technologies coming in the field. Mechanical Engineer will have to think out of his field as now a days the time has come that all the fields have become interconnected.

C. Be Innovative: Mechanical Engineer should always be open to new ideas, even if they come from sources outside the group. Companies always reward and regard the engineers who encourage innovative ideas, regardless of where they originated.

D. Follow the rules*:* Academia often rewards those who think freely. Industry does too, but within the confines of established design procedures and best practices. Learn to live by your employers' values and codes of conduct or move on.

E. Be a team player*:* Professional mechanical engineering involves collaboration among many different disciplines that must come together to resolve complex issues and formulate

solutions to bring products to market. As a result, communication skills are as important as technical expertise.

F. Make your boss look good*:* This is sometimes hard because engineers are often intimated by managers who are given the power to hire, fire and promote. A good manager, however, wants their employees to be successful so be on their side and your career's future will benefit.

G. Stay connected to your university*:* Keep in touch with your alma mater. Participate in technical societies to increase your networking reach. Writing technical papers and/or organizing technical sessions, attending national and international conferences/technical seminars will enhance both experience and company's reputation.

H. Keep learning*:* This is crucial as the tools used to do product design and analysis are constantly changing and improving. Stay ahead of the curve and seek out new assignments and opportunities to learn new technologies, sign up for training programs and make the most of company-paid educational benefits.

I. ***Be involved****:* It's important for mechanical engineers to network and build relationships when attending professional events. Good networking opportunities are events put on by professional organizations, such as the American Society of Civil Engineers or the American Society of Mechanical Engineers.

J. Find a mentor: If you're a young professional engineer, look for an older, more established engineer at your company who might be interested in mentoring you. Inquire if your employer has a mentoring program though its HR department. Many engineering societies also have programs that will assign you a career mentor. Or post something on LinkedIn that indicates you're looking for a mentor.

K. ***Beef up your communication skills****:* Many engineers prefer to stick to the technical design track, while others will want to branch off into management roles, which means you'll need to be comfortable talking to customers, giving presentations and working with outside suppliers, agencies, etc. Developing these "soft" skills is vital for engineers who aspire to be managers one day. Toastmasters International, a non-profit organization, is a great place to get your feet wet in public speaking

XII. SOFTWARE ENGINEERING AND SOFT SKILLS

Just like becoming a professional athlete requires more than pure athletic talent, the profession of software engineering needs specific soft skills, besides what most people think of as "coding". While coding boot-camps and online courses help familiarize students with methods to develop software, the professional software engineer has to develop their own soft skills to become effective. Producing useful code and building useful things with that code requires a mindset as well as a skill set, just as a professional athlete much have the discipline, team orientation and creativity to use their skills wisely. Here are the top three engineering soft skills given by Mohan Shah that can make or break one's professional software engineering career:

A. Software Engineering Soft Skill No. 1: Creativity*:* Since software engineers rarely start a project with a blank sheet of paper, they are often not considered "creative". This does a disservice to the word. Creativity, as a must-have soft skill for engineers, is characterized by imagination, then turning those thoughts into things. Software engineers inherently build on what exists, they try to improve things incrementally, but along the way they inject original thinking into everything they do. It's easy to think of "brainstorming" as a creative process. It feels good to throw ideas onto the table and to imagine things in new ways. However, the engineer must be creative within constraints of time, technology and resources. The accomplished professional will probe ideas with questions like "what made that idea bubble up?" or "what are we trying to accomplish with this?" The better an engineer understands the purpose behind the project, the better they can be creative in

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ways to make the project a thriving success.

B. Software Engineering Soft Skill No. 2: Teamwork : Teamwork is another essential software engineering soft skill, since most critical or ambitious software engineering projects are assigned to a team, not an individual. Startups and innovation projects require agile teamwork to determine priorities and ensure coordinated efforts across a wide variety of skills and roles. The agile process provides ample opportunities for feedback across teams and to ensure that everyone is on the same page. Software Engineers who communicate effectively, who think critically, make their teams better. In many cases, these teams and even team members speak different languages and have vastly different perspectives. A database engineer might be thinking in terms of scaling data tables using relational data model while maintaining data integrity and a programmer might be thinking of accessing that information through object model specific APIs and still trying to keep his/her application very nimble. How they work together has a direct impact on an overall system, particularly under varying server loads.

C. Software Engineering Soft Skill No. 3: Patience: Patience is a must-have soft skill for any successful software engineer. A professional disposition requires a great work ethic and a sense of patience. Everyone has their priorities. Dependencies are sometimes hidden across teams and systems. Those who are not patient, who cannot approach their teammates with respect and appreciation, cannot succeed. The next time you read a breathless account of technical breakthroughs, of organizations who churn out improvements in their systems like clockwork, consider how much work goes into each accomplishment. At the core of these organizations is a culture of learning, where everyone is willing to look at things with fresh eyes in order to address issues as they surface. Ultimately, being receptive to new information and willing to adapt to changing circumstances might be the hallmark of the successful software engineer.

XIII. MANUFACTURING ENGINEERING AND SOFT SKILLS

(Mohan Shah) Strong communication skills, the ability to speak in plain English, building positive relationships with stakeholders, and showing inspiring leadership qualities – typically called “soft skills”–are becoming increasingly essential for manufacturing engineering professionals. Now the time has changed as one’s technical abilities and sector experience were all that counted. Now it’s time to shift the career priorities and values, because soft skills such as communication skills are in incredibly high demand in the current competitive job market. Here are 4 main soft skills that have become mandatory for the manufacturing engineers at work:

A. Good Communication Skills: Strong communication skills are essential in the manufacturing engineering field, as one may often need to explain technical information to a non- technical or “lay” audience. Technical knowledge is critical, but the ability to communicate it accurately and concisely to an uninitiated audience is just as important these days.

B. ***Strong Leadership:*** For real career progression, individuals in the manufacturing engineering sector will typically need to display management potential. This may involve managing teams, individuals, projects or entire organizations. The ability to truly inspire and instill confidence is at the heart of all good leadership. Some people have natural leadership abilities, but good management skills can be sharpened with the right training and development.

C. Lateral Thinking: Whatever one’s particular job is, lateral thinking and problem-solving skills are always beneficial. Organizations will always appreciate someone who can keep a cool head in a crisis and find innovative, creative solutions to complex business issues.

D. Influencing Skills: The ability to negotiate with people at all levels of the business, forge productive relationships, and persuasively present ideas and opinions are important attributes. Confident influencers and decision-makers are always in demand.

When it comes to one’s soft skills, don't underestimate how important these are to a prospective employer.

XIV. SOFT SKILLS THAT EMPLOYER WANTS

Companies look out for a mix of skills depending on the nature of work they do. Here is a list of the most desirable soft skills that HR heads of various companies look for: Interpersonal skills such as communication (both verbal and written, including e-mail etiquette), persuasion, presentation, and active listening and learning.

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1. Good attitude with respect for the job at hand
2. Desire/passion to learn, share and be trained consistently
3. Able to confront reality. If possible, be a specialist in one field and generalist in others
4. Application of knowledge and concise understanding of "how things work"
5. Problem solving/analytical thinking and decision making
6. Honesty, integrity and impeccable ethics
7. Good time management and stress management skills when the pressure to perform is quite high.
8. Flexibility to work with people from diverse backgrounds (team player)
9. Positive approach and a "can do" attitude

XV. SURVEY RESULTS AND FINDINGS OF THE STUDY

1. In a 2015 Wall Street Journal survey of nearly 900 executives, 92% indicated that soft skills were equally important, if not more important than, technical skills. Your ability to develop your soft skills and build quality, legitimate relationships will help differentiate you from the pack and will lead to a rewarding and fruitful career in civil engineering.
2. Recently (2017), EFY conducted an opinion survey of engineering students, fresh professionals and industry analysts through various social media platforms to understand the importance of soft skills, apart from tech knowhow, for a successful career. 62.63 per cent respondents believed that soft skills were important but not the deciding factor.
3. 25.29 per cent believed that soft skills were extremely important.
4. Remaining 12.08 per cent believed that these were important as complementary skills.
5. A mid-2012 study from Millennial Branding showed that soft skills topped the list of must-haves for employers, with 98 percent of them saying communication skills are essential and 92 percent teamwork skills.
6. In a recent survey (2017) conducted by the American Society of Mechanical Engineers of both society members and nonmembers in engineering-related positions, respondents said they believe communication skills -- such as business writing, technical writing, public speaking, and presentation preparation -- are "crucial" for success as engineers work in and among more varied groups.
7. IEEE Spectrum explained, "every engineer's core mission is to try to improve the utility of things, to design products or processes that will solve problems better, faster and cheaper." This mission would rarely be achieved if not for engineers' ways of thinking, which often lead to problem- solving opportunities that would otherwise remain hidden. In the engineering fields, creativity can be as valuable to solving a problem as the technical skills to identify and troubleshoot the source of the problem. As such, creative thinking is a soft skill that engineers, scientists, and others in the STEM fields should cultivate in order to become invaluable members of their organizations.
8. A study from Northwestern University's Kellogg School of Management used almost 20 million papers over five decades and 2.1 million patents to demonstrate that teams increasingly dominate solo authors in knowledge production. The days of single-inventor innovations have been replaced with team research across nearly all fields. Whether you call it cooperation, collaboration, or teamwork, an engineer's ability to work with other people from different backgrounds is essential.
9. "For example, when designing a transformer for high- voltage transmission lines ... it takes more than one engineer to complete the project," the American Society for Training & Development (ASTD) recently explained. "It requires a team of engineers and other professionals -- drafters, project managers, and administrative staff -- working together and potentially interfacing with clients, regulatory agencies, subcontractors, and even public advocacy groups.
10. "In an engineering context, leadership incorporates a number of capabilities which are critical in order to function at a professional level," according to the National Society of Professional Engineers (NSPE). These capabilities include the ability to assess risk and take initiative, the willingness to make decisions in the face of uncertainty, a sense of urgency and the will to deliver on time in the face of constraints or obstacles, resourcefulness and flexibility, trust and loyalty in a team setting, and the ability to relate to others.
11. The classical book "The Unwritten Laws of Engineering" published by the American Society of Mechanical Engineers (ASME), with ideas dating back to 1944 from W.J.King and revised and enlarged by James G Skakoon, clearly shows that the softer and practical attributes of engineering work have endured across generations. The instructions include areas such as self management, being proactive, assertive, keeping commitments, relating to supervisor; always keep records, being clear and concise in documentation, tips for an engineering manager, and professional ethics.
12. A Harvard University study (2017) revealed that 85% of jobs & promotions happened because of the candidate's attitude and only 15% due to the facts and figures he packed under his belt. Within the Indian

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industry, there is a definite move towards backward integrating academics with the soft-skill needs including communication and team working.

XVI. SUGGESTIONS

Although a strong CV, track record and technical expertise may get one to the interview stage, they may not always get one the job. At interview, an employer will be looking for strong, clear evidence of one's soft skills such as communication skills. How one presents oneself in the actual interview will be telling, but one might also be asked to provide examples of one's soft skills in action in some of one's roles. Try to outline a number of scenarios where one displayed strong soft skills and how they positively influenced business performance or stakeholder relationships. For instance, did one effectively lead one's team through a difficult period or implement a new process that solved an ongoing "pain point" in the business? So if you're considering a move upwards in the organization, or simply to a new engineering and manufacturing job, always remember to promote a good, healthy mix of technical ability and soft skills like leadership qualities and communication skills to help one stand out from the crowd.

XVII. CONCLUSION

In these changing times, there is no one method to fit all situations. However a little thought will reveal a very important conclusion-the process of effectively imparting innovations, innovative ideas, soft-skills or any other skill for that matter depends on professing three fundamental competencies "Communication skills", "Psychology" and of course "Subject matter knowledge" Main soft skills required for a successful engineer are Communication Skills, Team work, Adaptability, Problem Solving, Mentoring, Patience, Human Values and Professional Ethics. This is a vast area of work and only an organization-wide concerted effort can bring change of the scale that is required today.

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