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To cite this article: Pia Lappalainen (2009) Communication as part of the engineering skills set, European Journal of Engineering Education, 34:2, 123-129, DOI: [10.1080/03043790902752038](https://doi.org/10.1080/03043790902752038)

To link to this article: <https://doi.org/10.1080/03043790902752038>



Published online: 23 Apr 2009.



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Communication as part of the engineering skills set

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(Received 21 October 2008; final version received 14 January 2009)

Engineering graduates are facing changing requirements regarding their competencies, as interdisciplinarity and globalization have transformed engineering communities into collaboration arenas extending beyond uniform national, cultural, contextual and disciplinary settings and structures. Engineers no longer manage their daily tasks with plain substance expertise; instead they must be adept at communication, collaboration, networking, feedback provision and reception, teamwork, lifelong learning, and cultural understanding. This calls for a concomitant change in university curricula, challenging the current university system to supply graduates that possess working life skills relevant in today's work communities. However, before committing to such a reform, universities need to understand the significance and strategic role of communication in engineering communities. This article attempts to establish the potential offered by corporate communications by first introducing factors undermining the role and reputation of communication, and further on, by slicing the communication function into activities related to strategy formulation, strategy implementation, and working culture, to examine how communication supports organizational operations.

Keywords: engineering communities; social skills; communication; strategy implementation; culture

1. Changing engineering communities

In the identification of its new role in the fast changing information society, European university systems are coming face to face with the changing demands and needs of working life and industry. The academia have awakened to the fact that graduating engineers, although skilful and knowledgeable in their subject matters, lack qualifications that provide them with prerequisites necessary when taking on working life duties. Induction periods are lengthy and orientation towards productive employment laborious, raising the question of whether university education is too focused on producing substance expertise and too ignorant of so-called social skills that turn this expertise into productivity and profitability. These process skills – learning to learn, lifelong learning, cooperation, communication, teamwork, intercultural cooperation, organizational understanding, and project management – represent the socio-cultural dimensions that are becoming increasingly important as globalization intensifies the demands for flexible, socially adept and communicative engineering communities (Christensen *et al.* 2006).

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Traditionally these social aspects of working life have been largely neglected and underestimated in corporate life and subsequently in university education as well. Engineering education has until now been strongly contents driven, social skills being a relatively recent notion in educational offerings. However, modern engineering communities are increasingly rendering crucial also the ability to integrate thinking, feeling, and behaviour in pursuit of professional objectives, pressing the university system to develop ways of teaching social skills (Emilsson and Lilje 2008).

Furthermore, towards the end of the last millennium the engineering world was struck by growing awareness that engineers operate and cooperate in interdisciplinary arenas necessitating understanding of the significance of social skills for a business and the integral role of socio-cultural aspects in the globalizing engineering communities where the members represent different educational backgrounds, cultures, and nationalities. In pursuit of industrial efficiency and effectiveness, these dimensions should be integrated into university teaching, giving cause to question the traditional lecture-based approach to teaching and learning (Lehmann *et al.* 2008). The curriculum change is, however, hurdled by ignorance and biases. How does communication fit into the master plan involving overall company operations and strategies other than as an ancillary activity incurring expenses? A peek into the factors undermining the status of communication in industry will help us understand the subsequent lack of interest in social skills in the academic world.

2. Underestimated role of communication

In the fiercely competitive environments of modern enterprises, all allocations of resources must be justified. Despite the undeniable merit credited to social capital, communication has still not received strategic status in the eyes of many corporate operators. Several reasons accounting for the difficulty in comprehending the strategic role of communication can be discerned.

First of all, traditionally communication, among other support functions, has been unduly underestimated as a resource-consuming and non-profitable area of corporate operations. Second, it does not play any visible part in yielding results or profits (Interview with Karasvirta 2007), unlike the core functions, although the role of such communications oriented competences as tacit knowledge, cooperation, human skills, and leadership are already acknowledged and known to bring advantage (Juuti 2002).

Another underlying reason is that unlike many other areas of business, the impact of communication is not easily measurable (Interview with Karasvirta 2007), and in alignment with Kaplan and Norton (2003) philosophy, corporations tend to focus more strongly on what they can measure; the other way round, it is difficult to justify investment in activities whose impacts cannot be verified. This measurement problem has roots in the fact that communication is so closely interwoven with all organizational activities that the mere definition of what is pure communication and what is leadership, personnel management or marketing is close to impossible. Even if we managed to define communication, the related measurements are typically focused on input or activities and efforts directed at communication, not on output, communications outcomes (Sudhakar and Patil 2006).

Yet another explanation for the inability to credibly establish the significance of communication is that communication, among other human resources, is associated with soft values, unlike core business activities that entail the potential to yield returns (Saarinen 2001). Topped off with connotations implying abstract phenomena such as culture, human relationships, atmosphere, and communality, communication is often disregarded as irrelevant.

Finally, company CEOs often take on their piloting duties with a CFO background, making them oblivious to the significance of communications. Naturally they cannot value what they do not understand, and the subsequent CEO-driven value system cascading down the hierarchical

levels distorts the image of the role of communication. Sadly, communicators can only blame themselves for poor image build-up, having failed in convincing corporate heads of the significance of communications measures (Interview with Karasvirta 2007).

Despite all the above-mentioned forces undermining the credibility and importance of communication, it is, however, evident that a company cannot NOT communicate (one of Paul Watzlawick's five communication axioms). Therefore, the decision on to what extent the company chooses to invest in communication activities is far-reaching and strategic.

3. Significance of communication skills

Schein (1969) claims organizational communication in face-to-face situations is one of the most important processes in an organization. He refers not only to the simple transfer of information from one employee to another, but to the conveyance of feelings, perceptions, and innuendos. This is where the strategic role of communication materializes itself most strongly, as this emotional aspect has been understood to offer a tool for mobilizing people and priming positive feelings and atmosphere in the organization (Goleman *et al.* 2002). Ultimately this leads to good performance, through a connection between the human aspects of work and organizational productivity (Åhman 2004).

Similarly, according to the author's research and work experience from communication tasks, careful, controlled and well-planned communication underpins the overall company strategy through three dimensions, that is, through strategy creation, strategy implementation, and working culture. In the pursuit of communicational indoctrination and establishment of the role of communication within engineering education supply, next presented is how communication is embodied or manifested in some of the daily activities taking place in engineering communities.

3.1. Communication in strategy creation

Any company wishing to survive and prosper in today's fiercely competitive business arenas must seek ways of finding and sustaining advantages over its rival companies. To outperform the competitors, a management team's yearly routines climax on the re-formulation and fine-tuning of the company strategy targeted to bolster the organization in adding value for the shareholders, customers, and other stakeholders (Ranta 2005).

The making of a company strategy, or strategy creation, has conventionally been the privilege of top management, although studies ahead conducted decades ago (Sierilä 1987) identified the benefits of so-called 'shared leadership' through more effective utilization of expert insights into future trends in the industry (Åhman 2004) by involving all hierarchical levels in the planning process (Ropo 2005). The true capabilities of individuals can only be perceived by the employees themselves, and subsequently their inclusion in the dialogue about future opportunities, leaning on employee capacity is justified.

However, this approach deserves criticism as employees' expertise is ephemeral and closely tied to their specific area of responsibility and the visionary capability of grass root-level employees may be narrowed down by the limitations stemming from their personal handicaps and incompetence (Interview with Karasvirta 2007). Second, seldom do lower-level staff that focus on their own specific activities have the expertise to view company operations as a whole, making them miss the big picture required when searching for a long-term direction. Third, human nature is inclined to foster concealed personal agendas that distort the common reality at the cost of the common good (Fineman 2003), thereby justifying the exclusion of lower-level members in strategy creation. Finally, it is not pragmatically feasible or possible especially in larger organizations to arrange sessions welcoming all the personnel in the discussions (Interview with Karasvirta 2007).

Especially in technology sectors, it is crucial to keep up with the latest trends and developments, and thereby strategy creation involves dialogue with the surrounding engineering arenas and communities, naturally implying communication and information management. Some companies are alert to weak signals in their environment, some rely on their internal capabilities when determining future direction, others base their strategy work on the balanced scorecard; whichever framework they choose to operate within, the related data collection, information sharing and strategy formulation necessitate communication.

3.2. Communication in strategy implementation

The current competence society builds largely on the ability to define the strategic direction and vision and to communicate this direction, although lately the focus has shifted increasingly to the implementation process. Strategy has ceased to be the result of formal strategy workshops; instead it is formed and re-formed through trial and error and continuous, fast-paced actions (Hannus *et al.* 1999). The ability to successfully implement the strategy has become more important, and to secure this, it is of paramount importance that the organization manages to root commitment and collaboration in the organization. This, then, cannot be achieved unless strategy planning and implementation are tied to one another through organizational self-reflection and feedback mechanisms (Kim and Mauborgne 2006).

There is strong research-based evidence that the implementation or materialization phase is more communicative than has previously been understood. The strategy needs to be communicated both top-down and bottom-up, not neglecting sense-making and creation of meanings, which are crucial elements against the background that instructions and actions cannot be devised if the set goal is too vague. Also, feedback and questions about the stated direction should be allowed and encouraged to facilitate organizational learning, growth and renewal (Aaltonen 2007).

When introducing radical changes, even the most inspiring strategy statement is likely to attract overwhelming mental change resistance among staff, necessitating extraordinary energy and efforts to obtain not only a positive response from the personnel but also highly motivated and energized contribution to the new direction. Grand visions cannot be achieved by merely pushing people in the right direction; instead managers must meet the human needs encountered at the highest levels of Maslow's hierarchy of needs underlying one's motivation: need for achievement, belonging, recognition, and self-actualization (Saarinen 2007). Subordinates need to be touched deeply in order to ignite the passion necessary to elicit the desired outcome.

Therefore the chosen strategy must be articulated in a way with which the audiences can identify, that is, so that the staff feel the strategy is in alignment with their values. All throughout the process of materializing the strategy in their tasks within the core functions producing products or services, the staff also require enthusiastic support, coaching, feedback, recognition, and reward from their supervisors (Kotter 1990).

Further adding to the need to communicate the strategic direction is that the recent attempts at improved cost efficiency have turned organizations leaner, cutting the size of middle management to the minimum and leaving lower-level staff with even fewer face-to-face encounters with supervisors (Interview with Karasvirta 2007). This entails more independent ways of working among the lower-level employees, necessitating initiative in information acquisition, analysis, synthesis, and knowledge application. Projects and teams become the forums for materializing the company's mission, and to make this happen, employees are expected to be proficient knowledge managers.

Many university graduates aspire to climb up the corporate ladder and take on a managerial position at some point in their career. Where on the lower levels it is the substance expertise that provides the employee with sufficient capabilities, on the higher levels it is the interpersonal, communicational, and conceptual skills that become more decisive. Contemporary researchers

believe the line between management or leadership, and communication is thin; Aula claims management *is* mainly communication (as quoted in Hirvikorpi 2005), and O'Rourke supports this with his observation that managers spend 70–90% of their working time in verbal interaction (O'Rourke 2004). Science has only recently discovered that the visionary capability of charismatic and transformational leaders stems from their personal attributes and behaviour; more explicitly, from their inspirational articulation that serves as a catalyst in the work community (Sosik and Dinger 2007).

3.3. Communication and working culture

Leadership serves as a bridge to the third dimension that embraces the working life culture, determined by the rules of the game, the ways of working, and the overall morale in the workplace. Culture is impacted and built by the organization's feedback mechanisms, leadership styles, ethics standards, corporate social responsibility practices, integrity and transparency, information management systems, and the overall conduct of the members. Needless to say, feedback cannot be given, people cannot be led, ethics cannot be demonstrated, information shared, or interaction accomplished without human communication.

Research indicates that it is the cultural aspect that brings added value to company operations; the operations of two companies may lean on identical types of processes, technologies, and products, and still their results may vary dramatically, with the only differentiating factor being the working culture (<http://www.greatplacetowork.fi/>, accessed 28 August 2008).

Studies mushroom on the connection between various communication originated aspects of corporate life and corporate results. The findings of the Great Place to Work 2006 study indicate that the more effectively an organization communicates and the healthier the company culture, the higher the company profits.

On average, the net sales of Finnish companies that ranked high in the study in 2006 grew by 17.6% compared with the previous year. According to Statistics Finland, the average Finnish company expanded its turnover by only 6% in the same period. What is noteworthy is that employee absences in these high-ranked companies clearly fell below the average, the absenteeism rate being only 2% (Interview with Hallapuro 2007), while absences are generally on the rise all over corporate Scandinavia due to problems related to mental diseases, misuse of alcohol, and inability to cope with work, all undermining productivity (Saarinen 2007). Admittedly, these figures tell nothing of causalities, but the correlation between various corporate cultural aspects and company performance is undeniably strong (Interview with Hallapuro 2007).

Communication as an essential building block of any healthy corporate culture is the tool by means of which the strategy is deployed and rooted in the organization to guide and direct daily operations; it is not an isolated mission, or an individual message, it is an integral and inseparable component of the core operations. It cannot be emphasized enough that communication embraces all corporate activities; instead of referring solely to specific messages, it translates into all corporate conduct and phenomena. In a nurturing environment, employees are capable of bringing the others into harmony with their intentions, which is known to be the most fundamental tool of successful business. This emotional economy manifests its importance not only within corporate internal interaction but in stakeholder interfaces, in particular, proving itself as vital for the bottom line as the money economy (Goff 1996).

4. Conclusion

In order to keep up with modern industrial job requirements, today's university education supply ought to help engineering graduates perceive communication as an operations enhancing asset,

by bringing together academic research knowledge with the corporate reality and attempting to match the quality and content of the course supply with industrial needs. This way our engineering students would no longer regard communication as a burden eating up corporate resources, increasing work load, or intervening in the profits yielding functions. Instead, for them communication could be the ultimate, decisive instrument in helping outperform the competitors and in shaping the company future through visionary strategy creation, effective strategy implementation, and ethical and empowering cultural traits.

Due to the pioneering nature, recent status, and lack of industrial feedback from the few communication courses currently available, it is hard to determine whether the right formula for providing our students with hands-on social capabilities upon taking on actual organizational tasks has yet been found. Traditional general communication curricula could be enhanced with frequent industrial visitors, dialogue with the economic life, and the staff's keen eye on topical issues and phenomena taking place in engineering surroundings and a subsequent interest in self-development, the education offering can be moulded to better serve industrial needs. Project-type exercises, project-based learning, and teamwork should be promoted and graded, and real-life cases harnessed to provide the students with a touch with the reality.

In this reality, communication is an inseparable part of corporate life, embracing all workplace activities and coming across in all behaviour involving inter-human liaisons. This is also where the greatest value and strength of corporate communication lies – it is manifested and practiced throughout all the hierarchical levels of the organization, throughout entire product life cycles, through all the processes and activities taking place, by all the corporate players, in all the stakeholder interfaces, within all the corporate functions. Whether communication is seen as information flowing between the different corporate functions, as the glue that ties all the corporate parts together, as a synonym for corporate culture, or as a factor boosting the overall operations of the entire money-making machine, communication does play a key role in ultimately bringing shareholder value.

In order to facilitate the allocation of scarce corporate resources in the direction of corporate communication and to provide the communication function as well as the entire organization with the prerequisites to bring added value to company operations through deliberated, motivating, transparent and empowering communications, the university system has to rise to the challenge and integrate communication into subject curricula. This is the first step towards self-actualized and self-leading engineers promoting organizational effectiveness and productivity in future engineering communities.

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Originally a linguist, *Pia Lappalainen* (1968) is conducting her PhD research in technology at Lappeenranta University of Technology. Her thesis topic 'Social capital in engineering communities' draws from her working history as a communicator within the IT industry, focusing on identifying such features of leadership, ethics and managerial communication that promote organizational success through intelligent application of emotions. Currently a lecturer at Helsinki University of Technology, she pursues ways of integrating communication aspects into university curriculum in order to help engineering graduates better meet industrial needs upon entrance to working life.