**Analyzing the Responsibilities and Influence of Engineering Managers**

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1. **Describe the Engineering Manager’s role in planning and decision making.**

* **Planning:** Engineering managers are important in strategic as well as operational planning namely:
* Establish technical goals which conform to organizational goals (Mintzberg, 1975).
* Effective resource allocation to deliver and fulfil the deadlines.
* Prediction of risk for the projects and producing contingency plan solutions (Jones & George, 2022).
* Make cross-functional planning with engineering, design, and production units.
* **Decision Making:** Engineering managers make both programmed as well as non-programmed decisions:
* They deploy tools of analysis based on data like decision tree, SWOT, and the cost benefit analysis.
* To increase the participation of teams, use participative decision-making (Drucker, 1999).
* They also find the difference between quality, cost, and delivery time without compromising innovation and risk management.

1. **Compare and contrast traditional versus non-traditional organizational structures and how each impacts the development/motivation of technical workers.**

* **Traditional organizational structures:** Traditional or matrix types of structures prefer neat lines of authority, central reporting, and codification. They provide predictability, disciplinary expertise, and simple career paths, and may hamper the flow of information and quench intrinsic motivation in the case engineers feel pigeonholed.
* **Non- traditional Organizational structures:** Untraditional formats instead of having defined hierarchies introduce cross-functional and highly autonomous non-hierarchical teams, e.g. agile tribes, holacracies, or networked equal-level Spotify-style squads. A multi-project investigation (Ogirri and Idugie, 2024) revealed that agile teams recorded a 21 % greater successful rate of projects and far better involvement and harmony between work and life as compared to traditional teams (researchgate.net)

The need to feel like a master of his/her activities and to have a sense of purpose seems to be met through autonomy, frequent feedback loops, and shared responsibilities, which are the main contributors to creative performance among engineers.

Such being said, the non-traditional systems are prone to role ambiguity, unnecessary repetition and fragmentation of decisions unless governance is strong. Hybrid-models, possession of stable, determinant functions with cross-functional temporary squads, tend to combine the advantages of the two worlds, providing engineers with a community of practice, and maintaining at a project level, nimbleness.

1. **Note at least three sources of power that exist within a work environment and discuss which are most effective in leading technical professionals.**

According to French and Raven’s (1959) classic typology there are five main bases of power that indeed take part in organizations namely: referent, expert, coercive, legitimate and reward power. Expert and referent power are usually most effective among the technical professionals:

* **Expert Power:** The sources of expertise power are identified as technical expertise. When leaders are able to show decisive knowledge of their domain, engineers easily follow them since expertise is a degree of trust and less risk in making decisions.
* **Referent Power:** Referent power is based on personal traits- integrity, empathy and ableness to champion the team. It encourages trust, psychological safety and sharing of knowledge.
* **Legitimate Power:** Resource allocation also requires legitimate power (formal authority) that, however, tends to stifle initiative when over-emphasized.
* **Reward Power:** Reward power (bonuses or promotions) can be used to persuade people to perform in the short term but having this form of power negatively affects intrinsic motivation when it is transactionally oriented.
* **Coercive Power:** The normative power (threat of sanctions) tends to be less applicable to the knowledge workers who have the chance to leave the company or simply give up.

The latest empirical studies reveal the positive relationship between expert power and referent power and creative performance and job satisfaction of STEM workers (Li et al., 2019). When managers apply these humane power bases, they promote experimentation and the need to learn constantly, which are key to innovation.

1. **Explain the challenges of effective delegation and how it can be used as a development tool.**

Delegation is not merely transfer of task, it is a leverage that is intended to develop talent. Important issues are:

* **Fear of loss of control:** The managers fear that the work outsourced by them would not be up to the quality or time line expectations.
* **Perceived lack of subordinate readiness:** Technical leads may either challenge the ability of the team members or preview more coaching in development.
* **Time pressure:** It feels to be slower when someone is teaching one something, than doing it by oneself.

According to Matey (2024), the key aspects of effective delegation relate to the choice of tasks that have the necessary level of complexity, the definition of clear performance criteria and the combination of authority and accountability (journal.ijresm.com). Three development dividends come when a delegated practice is sought effectively:

* **Skill Stretching:** Engineers apply emerging skills (e.g. ability to communicate with clients, ability to scope projects).
* **Confidence Building:** This is because successful ownership enhances self-efficacy and this results in proactive problem solving.
* **Leadership Pipeline:** The bandwidth of managers to do strategic work is one of the outcomes of grooming successors and establishing organizational resilience.

RACI matrices, progressive autonomy ladders, and after-action reviews are delegation tools that become institutionalized, and they also create a learning culture.

**References**

French, J. R. P., & Raven, B. (1959). The bases of social power. In D. Cartwright (Ed.), Studies in social power (pp. 150–167). University of Michigan Press.

Li, S., Zhao, Y., & Zhang, L. (2019). Examining the relationship between leaders’ power use and follower motivation. Frontiers in Psychology, 10, 162. https://doi.org/10.3389/fpsyg.2019.00162

Matey, D. (2024). Delegation as a tool for leadership development. International Journal of Research in Engineering, Science and Management, 7(7), 26–32. <https://journal.ijresm.com/index.php/ijresm/article/view/3114>

Ogirri, K. O., & Idugie, I. J. (2024). A comparative analysis of traditional versus agile project management methodologies on IT project outcomes. Asian Journal of Research in Computer Science, 17(9), 1–12. https://doi.org/10.9734/ajrcos/2024/v17i9495

Philbin, S. P., & Kennedy, D. A. (2020). Exploring the need for a new paradigm in engineering management and the decision-making process in technology-based organisations. Engineering Management Journal, 32(4), 7–21. <https://doi.org/10.2478/emj-2020-0024>

Daft, R. L. (2020). Management (14th ed.). Cengage Learning.

Drucker, P. F. (1999). Management challenges for the 21st century. HarperBusiness.

Jones, G. R., & George, J. M. (2022). Contemporary management (11th ed.). McGraw-Hill Education.

Mintzberg, H. (1975). The manager’s job: Folklore and fact. Harvard Business Review, 53(4), 49–61.

Stevenson, W. J. (2020). Operations management (14th ed.). McGraw-Hill Education.