The Role of Chief Technology Officer regarding R&D Management in Japanese Corporations

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1. Introduction, aim, and methodology
Since the late 1980s, companies began to appoint Research and Development (R&D) divisions’ directors as Chief Technology Officers (CTO). Today, hundreds of CTOs operate in companies of different sizes and in various industries around the world to perform a variety of technology management related tasks including technology assessment, road mapping or managing R&D resources and corporate R&D projects. A CTO is furthermore often expected to foster the interdivisional cooperation to achieve technological synergies or to fulfill tasks like representing technology on the board level, networking with external partners, etc.

We present the results of a first explorative study in the Japanese machinery, chemical products and electrical corporations including ten in-depth interviews with either CTOs or executives responsible for R&D of their firm.

2. Research findings
Our general observations throughout this research lead us to question if there are as many CTOs in Japanese corporations as Roberts [2001] reported in his study. At least in the companies we approached, it seems that only 10% of the large machinery and electrical companies employ a CTO. Roberts [2001] reports in his study a rate of about 96% on board level and 91% on the executive committee. Our results do not confirm these findings. Although some years lie in between his and our study, none of our interviewees indicated that they had heard about any corporation that had “delisted” such a function in recent years.

Comparing our results regarding the organizational influence and authority, especially the budget approval and appointment authority of CTOs with the study by Adler and Ferdows [1990], we cannot confirm their results that a significant share of CTOs has approval and appointment authority for all business units. Further, Adler and Ferdows [1990] showed that another portion of their interviewees had neither appointment nor approval authority for any business and R&D unit (corporate and product divisional). Again, we did not find support for this view in Japanese corporations. Most of our interviewees had approval and appointment authority for corporate R&D and sometimes shared authority for business unit R&D, but basically none of them had full approval and appointment authority for business units. When looking further at the relationship of the CTO and the CEO, as mentioned as being of particularly importance by e.g. O’Neill and Bridenbaugh.
we found that most of CTOs meet their CEO weekly or at least monthly formally and much more frequently informally.

Furthermore, Roberts [2001] discusses the relationship of the CTO and the CEO and highlights that generally CEOs are often highly involved in five aspects of technology management: (1) technology strategy development, (2) overall R&D budget decisions, (3) R&D project selection/prioritization, (4) internal technology resource allocation, and (5) selection of outside technology investments. Although all of these points were rated as being relevant during our interviews we could just prove that (3) and (4) are particularly relevant.

The items on the list of tasks/responsibilities of CTOs that we tested were derived mainly from studies by Smith [2003] and Adler and Ferdows [1990] but to some extent also from a very recent study by Lorenzen et al. [2006]. Basically our findings confirm that the tasks on their lists are of certain importance to CTOs. This is noteworthy, since the study by Adler and Ferdows [1990] in particular is already more than 15 years old. However, looking at our results in more detail and comparing our results with the list and ranking from Adler and Ferdows [1990] our results are very similar. The lowest ranked task on both lists was “representing the company, its products and technologies to the “external world” including the media”. Additionally, none of the interviewees specifically emphasized the importance of this point during the discussions. Comparing our results however with Lorenzen et al. [2006] we find a more contradictory picture. Our top ranked task (“managing the selection of research projects to ensure that these add value to the company”) ranked only of medium importance on their list, while their top ranked task (“monitoring new technologies and assessing their potential for new products/services for your company”) was the second last on our list. Actually, the second highest ranked task (“observation of development activities and technology portfolios of competitors”) on Lorenzen et al. [2006] list, was not mentioned at all during our interviews. This might be due to the limited extent to which Japanese companies are outward oriented and carry out business intelligence, since there is still a prevailing habit in the Japanese market to form cartels. When it comes to the task of “developing an IT-infrastructure”, which ranked pretty low on the list by Lorenzen et al. [2006], this task was also mentioned by only one interviewee. However, this tasks is discussed contradictory in the literature, e.g. by Grochow [2003] and Fisher [1999]. In many companies the delimitation of the CTO profile does not seem to be sharp enough compared to the CIO.

Interviewees during our research also mentioned additional tasks that had not been suggested by any of these prior studies (e.g. creating promising project teams, including the design of career development plans for successful technology project leaders, etc.). This task was so far only mentioned as a side note in a practioner paper by O'Neill and Bridenbaugh [1992].

When finally comparing the career developments of our interviewees with issues mentioned in prior literature, we find most notably that besides four of our interviewees, who had done their Ph.D. abroad, none of our interviewees had “real” international working experience. One might guess that this seems to be (still) a typical cultural issue in Japanese companies, however is contradictory to what Robb [1994] mentioned in his paper. He particularly emphasizes that a CTO in a large corporation should have carried out “an international assignment“. Robb [1994] further emphasizes on the “operations, marketing and/or general management experience” of CTOs, which actually was the case with two interview partners, although none of the ones with the official label “CTO”. These two persons had worked for the “global marketing group” in the “marketing of the digital media network company” before being appointed to their current position (i.e. the CTO equivalent). Further, the other items on the list of Robb [1994] could not be verified or disproved with our research approach.
Additionally, it seems noteworthy that basically all of our interviewees had never worked for another company outside their corporation during their whole career. As this career development (“seniority principle”) is (still) typical for large Japanese corporations, we might not find the same pattern in European or US corporations.

**Keywords:** Chief Technology Officer (CTO), equivalent position, role, authority, organizational influence, span of control, task, responsibility, skill, qualification

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8. **References**