IT Networks and Organizational Design Complexity in Japanese Firms

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The current state of Japanese corporate information systems has been examined to find out which specific organizational design issues and features are entailed with the introduction of network information technology. On the basis of newer theoretical works, empirical studies, and data sources it is argued that: (i) The progress in networked info-communications technology poses momentous challenges to the hitherto celebrated tacit knowledge structures and organizational learning in Japanese firms, while the activation of new forms of multimedia conveyed knowledge creation becomes essential; (ii) In recent years informatization trends have resulted in a generally widening gap in the informational production level between large and small firms, particularly in manufacturing; and (iii) The introduction of networked information technology in Japanese-type corporate organizations is normally involving transformations primarily driven by supplementary adjustment logics rather than drastic substitutionary interventions, leading to corporate organizational structures characterized by high degree of complexity which IT networks can instrumentally support.

Introduction

The development and spread of digitized information technology (IT) networks is expected to impel essential transformative socio-economic activities. Fundamentally, the expectations move in two, usually interrelated, directions, namely: (1) the conversion of existing structures, and (2) the emergence of new innovative modes of conduct.

From a business perspective these directions primarily correlate with the ongoing processes of corporate restructuring and the advances of new business ventures. This paper primarily focuses on some of the transitional aspects being imposed on existing Japanese corporate organizations.

Due to their generic socio-technological characters, the design and introduction of IT-based network and multimedia services make up an interesting testing ground for managerial and organizational change studies. Arguably, this perception is gaining particular relevance in the case of Japan, being in the process of undertaking fundamental industrial restructuring, while usually being recognized for its pronounced reliance on human networks and social exchange dynamics. Duly recognizing that the introduction of IT networks is far from the only factor influencing corporate restructuring, the interest largely concentrates on impacts and strategic issues embodying IT mediated organizational designs. It is assumed that IT offers a new ground of opportunities for designing complex and competitive organizations. Concurrently, the speed and volatility of technological progress tend to force social organizations into reactive positions. The basic research interest of this paper is, therefore (a) what is the current state of Japanese corporate informatization? and (b) which specific organizational design issues and features are entailed with the introduction of networked IT into Japanese corporate systems?

The research work embraces newer theory, Japanese data sources, empirical survey reports, and own interview materials. Methodically, The paper is organised in four tightly interrelated main sections, dealing with: (1) Theoretical issues and approaches; (2) Networks, Knowledge and Organizational Transformations; (3) IT and Open-Style Management Requirements; and (4) Design and Redesign of Organizational Complexity

IT networks and Japanese-style Organizations -Theoretical Issues and Approaches

With a tendency to flatten organizational structures, open networks, incite direct decision-making, enhance
differentiation among workers, put less emphasis on face-to-face contacts, and so forth, it is believed that the introduction of IT represents a challenge to the Japanese organization and management style. Information technologies, like many other new technologies, simultaneously pose a threat and opportunity in relation to existing social networks, societal principles, and spheres of human interactivity. In the discussion and planning of social usage of new technologies, many scholars tend to belittle social evolutionary forces. Nohria and Eccles, for example, point out that network organizations are not the same as electronic networks, nor can they be built entirely on them. The question is whether these electronically mediated exchanges can be as effective as relationships based on face-to-face interaction.

Such observation is, however, trivial, and the generated discussions of little interest. Moreover, the subsequent question is misleading. Besides being meaningless when posed generally, it is caught up in a categorical dichotomy that is not, and should not be, real in the information age. Essentially, electronic information networks are not representing equal substitutes to inter-personal relationships. IT based corporate networks are work tools introducing different types of efficiency performance and opportunities. These cannot, however, be matched, neither ignored, by personal relationship based interactions, and vice versa. IT systems have to be shaped and selectively adjusted to needs and reality. The deriving multiplicated supplementary utility framework results in a widening space of possible strategic choices and approaches to organizational design.

Evidently, face-to-face contacts are characterized by co-presence and widely scaled human interactivity. As such, these cover an extremely varied spectrum of subtly rooted relational moods and objectives. Other means, or media, of communicative action may, however, in certain situations be deliberately preferred in case such are available and appropriate. Many of the features being unique to face-to-face interaction may be regarded as noise in given situations, or as simply not desirable in the present state of affairs. The constant increase of communication flows will produce distinctive limits to how many full-scale communicative impressions it is possible to cope with individually. Indeed, agents may see electronic network mediated communication as being the potential carrier of liberation from hampering social structures such as traditionalized behavioral rules, prejudice, and appearances. Based on this understanding, networked info-communication technologies possess instrumental features of great relevance to corporate organizational restructuring.

First, from a Japanese intra-firm organizational perspective, a different approach to the heretofore theoretical views on uncertainty and ambiguity environments is suggested. In general, the challenges related to imperfect information in organizations are increasingly being part of an agenda shifting its main focus from scarcity to overflow. Moreover, ever growing speed and richness of flows are chief factors sustaining the threat of information uncertainty both internally and externally to organizations. Not surprisingly, most theory on IT networks and organizations is premised on the assumption that complete information certainty and unambiguity is the commonly perceived goal to be attained. However, this is not always the case in the real world. Many Japanese organizations are inclined to maintain a certain degree of uncertainty and intransparency, primarily as internalized mobilization incentive. It is hypothesized that, in such cases, the uncertainty and equivocation pervaded environments are particularly serving as support mechanisms for unitive interdependency structures, immanence, and tacit knowledge-oriented learning organizations. Forces within organizations can easily have an interest in sustaining uncertainty and (managerial) imperfections in order to protect and promote inherent relational structures. Considering IT as a force ‘unfreezing culture’ it is, actually, conceivable that the more introverted a corporate culture is, the higher the likelihood that some intrinsic anti-moods prevail and will achieve a saying.

The fact that information management studies in Japan have predominantly been displaying an information-processing perception of organizations points in the same direction. Accordingly, organizations in themselves are understood as information processing systems. If uncertainties raise their process capability is assumed to grow accordingly in a somewhat organic task-group centered manner. This is, however, far from implying that social dimensions are being ignored. Rather, the so-called ‘J-firm’ corporate network organizations, their distinct complex information systems and accompanying indigenous information coordination and processing skills are almost taken for granted. As proved by Castells, this perception can, actually, be verified socio-structurally by
looking at the actual employment figures and classifications for Japan in an international comparison. The figures substantiate that Japanese information processing tasks to a great extent have been, and still are, functionally embedded in the production process. Organizations have, in a rather natural and "invisible" manner, tended to integrate information processing into the entire production flows. Consequently, social dimensions of organizations in Japan are frequently being discussed in respect to company/sector managerial cultures either constraining or facilitating the introduction of particular IT networks and multimedia systems. Almost unanimously, top management leadership within the company is assessed to be of growing importance to the successful promotion of IT systems and multimedia services. Also the upbringing and activation of OA leaders in every department is regarded important. Furthermore, it is widely contended that management styles and work processes should be reformed synchronously. Conversely, high initial and operation costs, and the lack of top-management leadership, recognition, literacy, and system technology are regarded as primary obstructing factors. Consistently, constructive top management participation is judged as being crucial to success. However, studies and interviews reveal wide distance between 'good' top-down (progressive and flexible) and 'bad' top down structure (conservative and rigid) in Japanese organizations. The former can be categorized as successful participatory management practice whereupon top management clearly takes the lead by setting examples. Managers are expected to launch actual design examples and 'spirits' that strive to balance the introduction of new business process strategies, embracing the potentials of IT, with generally convincing transformations of existing human resource management cultures. Management by examples, in respect to the introduction of info-communication technologies, does not necessarily imply that CEOs and top managers stand up and promote themselves as role models. Rather, in a Japanese context, it implies promotion of progressive spaces (e.g. project teams and departments) which deliberately serve as visualizers and benchmarks in front of the entire organization. Case evidence among Japanese SMEs, introducing IT systems into their organizations, indicates that some of the best results are achieved under the leadership of so-called 'hybrid managers', i.e. managers commanding an adequate blend of technical skills and business knowledge. Such leaders often become the entrepreneurial founder and manager of the firm. However, formal hybrid manager skill structures alone do not automatically imply sufficient capability to spur organizational designs apt for socio-technical change. In general, a quest for more professional and convincing managerial leadership and responsibility latentily exist in Japanese organizations.

It Networks, Knowledge, and Organizational Transformations

An information economy sustains the belief that a flat organizational mode, in which operational tasks and coordinational tasks are integrated, will be more productive than traditional hierarchies. Concurrently, increasing demands are put on firms' creativity and flexible organizational switching capacities. The progress of information technology shortens the lifecycle of products while enhancing the importance of speedy business processes, e.g. time-to-markets and swift localized decision-making. Moreover, the current trend of globalizing network industrialization sets focus on firm's ability to enter into strategic alliances and cooperative relations. Much suggests that the present international business environment increasingly forces firms to act according to the dictates of what from a game-theoretic viewpoint has been coined "co-petition". Evidently, as the distance between production and science constantly narrows, this applies in particular to R&D intensive operations. According to Konsynski and Karimi:

Coordination and partnership across complex networks of organizationally and geographically distinct entities dispersed worldwide is becoming a primary source of competitive advantage.

In support of this set-up lies the fact that, besides being remarkable processors and calculators, computers (including computer integrated devices) are playing a core function as coordination technology, linked into extending networks ordering and coordinating activities and information flows. Electronic IT network systems, such as EDI, LAN, CALS, Intranets and groupware, are, for example, becoming indispensable state-of-the-art solutions to cost-efficient coordination of large supplier networks and HRM. Essentially, the coordination power induced competitiveness synergism of these corporate information systems predicates strategic formation of open decentralized networks.

Concurrently with software standardization, integration, and open flexible network systems becoming the
norm, many of the social-exchange enshrined coordination skills of Japanese organizations are becoming less important. Confronting a present-day business environment, demanding more stress on creativity, bottom-line results, and speedy alliances beyond company frameworks than on internal coordination, the Japanese-style organization needs to reduce its attention to internal consensus features. The question therefore arises how to make effective use of IT in the process of transforming traditional organization styles? According to Malone and Rockart, a first-order effect is to substitute information technology for human coordination. With the typical Japanese hierarchy being distinctly inflated in its middle layers this translates into an immediate diminution of clusters of middle managers. Evidently, straight-for­
warded lay-offs in labour intensive sectors have played a central role in the Western business restructuring experience. Again, however, substitution represents a too simplified managerial approach. First, it is conceived that some inervate social structures may constitute real assets if wisely forming part of a network organization fit for the information age. Secondly, the overall social environment thoroughly discourages such conduct. Thirdly, an agenda for IT mediated transformations should be careful not inflicting setbacks in organizational strength features underpinning human resource development practices and knowledge creation.

Generalists-oriented middle-management organizational redundancy has, for instance, been interpreted as part of an entrepreneurial ‘middle-up-down’ management style in Japanese firms. The role of these middle-layers as processors and mediators of tacit knowledge has especially been appraised in the context of incremental process innovation and organizational knowledge creation processes. According to Nonaka.

Intense interactions where information is redundant facilitate the transfer of tacit knowledge among team members. Since members share overlapping information, they can sense what others are trying to articulate. Especially in the concept development stage, it is critical to articulate images rooted in tacit knowledge. Meaningful information arises as a result of the conversion of tacit knowledge into articulable knowledge. Redundancy of information facilitates this process.

Following this argumentation, the elimination of redundancy structures among the middle-layers would in many instances lead to unintended results.

Although there is a lot of truth to this view, notably in respect to human resource development and working task flexibility, it lacks socio-technological dynamic. Along with the progress of networked IT and the scientific methods of production new forms of workforce intellect and creativity are in demand. Knowledge being effectively integrated into innovative global partner-based R&D activities is increasingly scientific and standardized in nature. Shared information (both stock and flow), subjecthood orientation and end-user computing are forming basic user principles behind Data bases, Warehousing, Groupware, Intranet, and many other IT system services. Presumably reflecting the typical team-oriented work style of most Japanese organizations Groupware solutions (e.g. Lotus Notes) have gained considerable popularity. Also the implementation of Intranet systems have grown rapidly since 1996, although user surveys and cases report some difficulties in making comprehensive use of their potentials. Obviously, the introduction of IT systems, in whatever category, implies that Japanese organizations need to cultivate much more ‘computed’ knowledge exchange upon the base of former tacit knowledge structures. One issue at stake, is to reconstruct company’s internal communication via Groupware in ways transcending barriers of imminent tacit knowledge dependencies. It is, for instance, conceivable that Japan’s hitherto backwardness in organizational computing may partially reflect workforce redundancy and deliberate stress on tacit knowledge within and between organizations. In any case, the very speed of international business processes outdistances institutionalized middle-up-down management (whether really existing or not) and much of the redundancy entailed. Much of the ‘tacit knowledge-ism’ attributed to Japanese firms represents inveterated ways of sustaining introverted information uncertainty environments and configured power relations. In support, recent research confirms that tacit knowledge thrives particularly well in definite demarcated systems and long-time interconnected worker communities. The interwoven nature (e.g. sustained through intensive work force transfers) of Japanese organizations, therefore, needs critical considerations vis-a-vis the implementation of indispensable reforms complying to the challenges posed by networked IT and global industrial competition dynamics.

What new organizational design outlines based on the impact of IT are then under emergence? Eccles and Nolan, for example, identify two basic levels of design
entailed, namely superordinate design and self-design ('adhocracies'). The superordinate design implies senior management responsibilities, primarily related to framing contexts for swift decisionmaking processes and outlining infrastructural support for self-designed knowledge-worker activities. Self-design underscores the autogenous team-centered organic character of the network organization. Such design principle is being indicative of a rising tendency towards task-oriented organizations which, inclined to quick individualized judgments and responsible decision-making, are being more concerned with the efficient accomplishment of tasks than firm boundaries and traditions. Hence, greater leeway to self-design, either within project groups or subsidiaries, is reported as being one of the restructurings aims of many Japanese firms. Naturally, this objective contributes greatly to exert influence on the existing institutionalized Japanese human resource management system and invites IT based databank support and coordination systems. In the case of superordinate design, the framework for such practice should, in general, not be alien to Japanese organizations. The entailing requirements do, however, challenge some current inertia syndromes primarily deriving from internalized management structures and corporate governance practices.

**IT and Open-style Management Requirements**

A large share of the constant product innovations done by Japanese manufacturers, particularly in electronic goods, has taken onset in the conquering of 'Fordistic' consumer markets, proprietary standard creation, and 'lock-in' oriented value-adding strategies. The, hitherto-introverted nature of Japanese production management and business processes is being reflected in the current inter-firm organizational structure. The Japanese keiretsu-type business groups have each formed their extended multi-level hierarchical supply chains and linked these up with own network information exchange standards. However, network economics per se involves competition dynamics of diverging nature from those instigated in the 1980s by flexible specialization strategies based on computer-aided production automation technologies. For example, the dynamic de facto user standard spreading effect of networked products and services engenders economics of scope and, in most instances, scale strategies. Such network effect is, for instance, framing many of the critical mass and inter-connectivity prospects embedding the progress of new business strategies relating to CS digital broadcasting and online marketing services. Fundamentally, the more users (customers), the more utility-value (satisfaction) paradigm constitutes an immanent driving force behind de facto standard objectives and open networks. For most industrial sectors this implies that a transformation from 'introverted-type management' to more 'open style management' is required.

In terms of introducing organizational computing and open computer networking, a striking discrepancy exists between large manufacturers and small lower-level subcontractors. Authoritative survey data collected during 1997 among manufacturers, confirm that small-scale enterprises are lacking conspicuously behind in terms of computer use and electronic networking. As regards the internal online situation, 42.6 percent of the small-sized manufacturers (>20 employees) reported that they were not made online, while 46.3 percent responded "no relevance" as they operated only one computer. For middle-sized manufacturers (20–299 employees) the figures were 25.2 percent and 46.5 percent, while figures for larger manufacturers were stated as 3.2 percent and 6.4 percent, respectively. Obviously, the shop-floor centered work, learning and management practices of most Japanese SMEs facilitate close face-to-face contact between top-managers and workers, as well as among workers. Because of these, usually highly valued, close face-to-face interchange structures, internal use of online computers is rarely judged an urgent, or even relevant, management goal. In fact, data reveal that internal online use of computers is comparatively far more widespread in these SMEs where managers practice indirect control of work and business processes.

Another explanation is rooted in the industrial structure. With a comparatively high ratio of its production subcontracted to its elite component suppliers on a stable long-term basis, the parent manufacturers usually only deal directly (online) with these first-level business partners. While it is not unusual for a large Western manufacturer to link directly to some thousand suppliers, the number in Japan is normally only a quarter to a third of this. Hence, stable hierarchical transaction patterns facilitated by distinct diversification processes of the Japanese industrial system have, so far, reduced the need for open computer networking. Actually, top-efficient proprietary electronic communication systems between parent manufacturers and their intimate elite suppliers have
existed for long and supported fine-tuned logistics upholding excellent industrial performance records. This internalized system infrastructure has, however, also translated into a dependency on expensive custom developed software solutions. In an era of packaged software, Japanese firms are now impelled to embrace more standardized solutions. Hereby, they are not only saving considerable costs but also getting access to precious updates and innovations, for instance, assisting them in addressing changing markets. Characteristically, firms are not embarking on total switch strategies. Rather they are leading the demand for new types of flexible packaged mix-and-match products (e.g., SAP R/3 ERP). Structural facts also point to the importance of studying existing network formations in user environments. An additional reason, rooted in the socio-politico structure, relates to the fact that the comprehensive public SME-oriented policy programs in Japan have largely perceived their leading mission as 'protecting' their target group. This reactive logic has in subtle ways penetrated the managerial mind of many small-scale enterprises.

For Japanese industry, in general, required costs and management resources have been two recurring main concerns related to informatization. Moreover, along with the diffusion of client-server information systems and network computing, transmission security and protection of know-how, privacy and property rights are being real, and often unprecedented and unforeseen issues of growing concern to Japanese firms. The spreading use of Internet-based (including Intranet) information systems in recent years has given further impetus to this concern. In many instances the security concern has a particular obstructing effect on the informatization of SMEs, which seldom are sufficiently serviced by professional system specialists. Furthermore, seen in the light of narrow industrial productivity measures a certain reluctance could, at least up till recently, be justified in various industrial sectors. Known as the 'productivity paradox' of IT, essential discussions have evolved around the fact that ordinary economic statistics generally end up indicating a negatively, or largely neutral, correlating trend between IT deployment and productivity. Indeed, in the face of an economic recession and ongoing restructuring processes, such discussions are of relevance to Japanese firms. This paradox, however, primarily reflects transformative instabilities and irrationalities, for instance in respect to technology and contents maturity, during the formation period of a globalizing informational economy. And, to a still larger extent, it rather reports about the inadequacy of traditional economic statistics in grasping the generic character of organizational and economic dynamics of the information age. Such inadequacy surfaces, for example, in respect to market expansions, integrated value-chain effects, professional quality standards, management of 'intangible' intellectual assets, digitized network dynamics, technology convergence, etc. Hence, recent discussions in Japan, on reasons why investment effects are not showing as expected, have directed much of their focus towards latent frictions in the organizational setting and operational environment of the firms.

In fact, against much hype, total Japanese investments (public and private) into informatization took a downward turn in the early 1990s. The growth in private informatization investments went negative in 1991, but recovered during 1993. Finally, reflecting the multimedia and Windows 95 boom, an overall growth was recorded in fiscal 1996, to reach 6.9 trillion yen. Upholding the trend, 51.2 percent of large companies reported increase in allocated informatization budgets for fiscal 1997 (26.9 percent no change), against 52.4 percent (31.3 percent no change) for middle-sized companies. Internet use, in particular, jumped from 11.7 percent (regardless of firm size) in fiscal 1995 to 50.4 percent in fiscal 1996. A survey of April 1997 reveals that while LAN is the dominant network in use within the domestic company framework, business Internet is the most frequent used network as soon as communication exceeds the company framework (domestic and overseas). The LAN market (service, software, hardware) has recorded some fifty percent yearly growth in the period 1995-1997. This testifies to the fact, that many Japanese companies are gradually implementing open network structures. Moreover, many Japanese companies have thoroughly started to realize the opportunities of the Internet, also as part of their expanding Groupware support system. Again, however, remarkably few small manufacturing suppliers have started to utilize the open Internet structure strategically to colonize new markets and enhance competitiveness. In 1997, almost eighty-five percent of the large manufacturers (<300 employees) were familiar with the Internet, compared to less than ten percent of small-size manufacturers (≥20 employees): 21.4 per cent of the small manufacturers had no knowledge of the Internet.
EDI is another IT network system area (data control/process control/network control) reflecting the Japanese industrial structure and part of its restructuring agenda. Japanese company groups have, for years, built up costly proprietary and customized solutions ultimately resulting in a fragmented infrastructure of numerable incompatible EDI systems. Lately, however, Japanese businesses have shown a coercive effort to unite to a set of national compatible ‘CII syntax rules’ designed particularly for Japanese transaction practices. The CII standard parallels, and subordinates architecturally to, the internationally accepted EDIFACT standard and the syntax rules handled by ISO. The use of EDI began early in Japan, especially in the retail industry (e.g. EOS/ECR/POS), and is now manifestly developing its management domain from only embracing company groups (proprietary/online system) in the 1970s to a fully international scope (public/global network system) in the 1990s.\(^{33}\) According to MPT, the corporate EDI ratio reached almost forty percent in 1996, but is still conspicuously concentrated among larger sophisticated ones.\(^{34}\) Still, reluctance among many SMEs exists despite the obvious potentials and institutional support being offered. Public surveys demonstrate, for instance, that far more than half of the manufacturing and trading SMEs have no knowledge of EDI and CALS. This is further confirmed by 1997 surveys on computer-based tele-ordering (in/out) among Japanese manufacturers. Here 95.7 percent of small-size manufacturers, and 72.3 percent of middle-size manufacturers, report they currently are not using computers (but telephone or fax) to place or accept orders.\(^{35}\) Moreover, the introduction ratio of LAN among SMEs is about half of that of their American counterpart. It is conceivable, however, that cheap, secure, easy-to-handle, customized Internet EDI solutions (e.g. TV mediated) aimed specifically at SMEs in general will make up a technological key approach leading to a real breakthrough. Most Japanese corporate users of EDI also point out that efficient day-to-day operations tend to be founded on carefully executed face-to-face pre-arrangements, hereby underpinning the supplanting utility orientation. Meanwhile, an overwhelming eighty percent of the users recognized increased efficiency in business operations. Improvements relate, for example, to lead time reduction in component procurement and shrinking component storage. Again, the case of EDI use gives indication of a general widening gap between the international competitiveness of primary suppliers and lower level suppliers.

### Design and Redesign of Organizational Complexity

As also underlined by EPA, the growing use of IT is increasingly placing limits on the traditional practice of fostering internal supplier-manufacturer relationship embedded technological development processes.\(^{36}\) Hence, in compliance with globalizing techno-economic competitive principles, the progress in information technologies causes Japanese companies to reorganize their supplier networks. The design of open and flexible extended networks are required to upgrade fast-product-cycle industrial management, take advantage of value-adding synergy effects, and make increased strategic use of external resources on a global scale. Indispensable specialist-oriented team dynamics behind continuous R&D based innovation processes and the influx of new technologies constitute major push factors. Also, growing cross-national collaboration agreements and R&D intensive corporate alliances involving Japanese manufacturers compel these to diversify their networks and supply linkages. Rearrangements are often prompted by international business developments and influencing development patterns of overseas production networks. For instance, Japanese manufacturers are increasingly invited to extend their hitherto transactional relations, such as OEM contracts, to outsourcing oriented strategic R&D collaboration agreements with foreign manufacturing partners. Just judging narrowly from an ordinary economics of transactions perspective, an intensified use of IT interchange incites Japanese companies to make increasing use of organization external sources of production and specialist skills. Decisive is, however, the fact that companies concurrently are capable of imposing their minutely systematized supply and quality control standards. The elaborate manufacturer (procurer)-supplier relationships and logistics in the complex Japanese industrial network formations are rooted in technical perfection and interlinked activity spin-offs. Such branching-out dynamics show that tightening and loosening of company boundaries occurs constantly. Meanwhile, Japanese firms tend to nurture a clear perception of their structural boundaries internally, as a disciplined meaning embedded system of spaces. This is, for instance, reflected in Takagi’s stress on the internal-model concept in his ‘poly-agent systems theory’ for informational networks.\(^{37}\) The theory claims that a ‘poly-agent society’ is under formation, where firms, as corporate network agents, each construct their own internal models and link up with external systems to enter market
transactions through the form of ‘poly-agentical’ client-server relations.

The international firm of the information network age must be conceived as an entity which commands an expanding variety of synchronically managed industrial network relations developing over time. Indicatively, the spread of digital information networks gives rise to virtual corporation concepts and, especially, provokes a range of new coherence-concerned theories on the firm. What in newer business literature often is denoted ‘the extended enterprise’ is essentially reporting about extending operations and alliances beyond organizational frameworks due to extended flexible network structures. Seen from the viewpoint of a typical inter-networked Japanese firm, increased open strategic transaction patterns beyond the company framework represent almost a third dimension in the organizational texture (for instance, embodied in rapidly dispersing Extranet designs). Intra-firm reforms, diversified organizational externalizing patterns, and genuine outsourcing strategies are now often forming part of the same managerial agenda. In fact, Japanese manufacturers have lucid interests in selectively maintaining some of their well-established closed-network features. Anchored to the technological leadership and capital goods export orientation strategy of Japanese economy, manufacturers are consciously eager to upgrade internally while preventing core know-how and skill-formation outflows. Moreover, Japanese-type production networks often command a built-in flexibility against external fluctuations. On this backdrop, Japanese firms often endeavor to design IT strategies for complex organizational frameworks serving competitive strengths linked to both open and more closed network structures.

In order to understand how Japanese organizations manage such transformation, the importance of space creative solutions must be taken into consideration. Organizational space creation clearly conjoins with recent theoretical attempts to order and explain corporate modularization concepts, but from a somewhat different outset less rooted in outright vertical integration paradigms and production-economic typologies. However, both categories apply that advanced info-communication technologies are fundamental prerequisites for efficient and process-oriented organizational design. In this context, space creation may be perceived as a socio-morphologic activity, or approach, aimed at facilitating envisioned organizational behavior and transformation. The creation of organizational spaces can as well represent forced strategic responses, building up complexity less driven by managerial visions than by customized accommodating reactions, in the conflictual zone between social integrity and structural challenges. Due to the flexible organizational patterns and integrated group-based work-sharing and learning processes in Japan, space creation strategies are turning especially relevant in the management of change. For many managers spin-off operations represent space creation strategies potentially capable of realizing what often is an uphill task in the existing internal organization. The primary role of new organizational space designs can be highly diversified, stretching from parking sites for surplus workers to highly specialized international R&D hubs or head-quarter functions. A growth in number of subsidiaries, company ventures, and related company constellations bear witness to increased restructuring efforts, particularly in respect to human resource management (primarily personnel transfers) and technological innovation (primarily new business development). Meanwhile, these externalized entities are expected to, one way or another (i.e. rarely systematized), become capable of transferring technologies, knowledge and ‘spirits’ back to the parent company. In this respect, complex organizational space creation can be seen as managerial strategies to construct evolutionary learning organizations and seek innovation potential through the formation of network resource complementarity.

Concluding Remarks

The findings and theoretical propositions suggest that Japanese organizations, supported by info-communications technology systems, both in their internal and external relations, are gradually opening and diversifying their network relations. In most instances, their approach tentatively takes outset in supplementarity to existing complex information systems, somewhat different from the way many US firms have adapted their organizations to their strategic information systems. In respect to the introduction of advanced IT systems, it means that their implied open network infrastructure is often initially dealt with as superstructures to existent organization infrastructures. Spaces for open networking are being created and introduced piecemeal to the entire organization. Meanwhile, existing organizational assets, for instance inter-personal and inter-organizational communication exchange structures are, to a considerable extent, sheltered from dramatic changes and efforts are mobilized to prevent techno-paradigmatic clashes. More-
over, an IT infrastructure supporting inter-organizational information flows and shared information is important in order to benefit from the externalization synergy and sustain organizational coherence. However, the coordinating power of computer networks and the quest for explicit knowledge performance, among other things, will impel a shift from redundancy to well-defined complementarity structures, for instance on external contract terms, and slimmer organizational profiles.

The global move towards more open network industrialization, management and standards will expose Japanese firms to fierce competition forcing production management upgrading, value-chain refinement, and clever strategic use of external resources. However, it is seen that Japanese firms intend to embark on wide-ranging, and largely irreversible, outsourcing strategies at the expense of organizational spin-offs. The Japanese case of industrial organization may, however, lend structural support to the hypothesis that spreading IT networks generally are leading to smaller organizations. Such networks, as being especially apparent in the case of rapidly diffusing Internet-based systems, are technologically fit for supporting the complex Japanese-type industrial networks. Meanwhile, IT network designs inherently function as strategic tools for stepping up the value-chain and time-to-market processes. Hence, an ongoing effect of the present industrial upgrading in Japan, vis-a-vis comprehensive IT system integration and the implementation of new systems, eventually turns out to be increasing co-sourcing and more open strategic network relations, combined with rationalization of traditional non-networked bottom-level suppliers. In general, an informational backwardness of small manufacturers is observable. Data indicate that this situation may aggravate under the present economic recession, inflicting an impact on the Japanese industrial system.

Finally, it is obvious that complex organizational space creation has its limits as pure 'pretext device'. On the other hand, the proactive venturing role in regard to activity expansion and transformation holds noteworthy potential which can not be ignored. Organizational spaces can be designed as laboratories for new IT-based work, learning and management practices with a solid working capital base. In such cases, one can argue that these spaces have a management supporting role to play in respect to the growing quest for management by examples practices. Likewise, organizational spaces are being created as specialist-oriented entrepreneurial units fit for new business activities. Such units are, for example, created with the aim of exploring and developing the largely indigenous principles of network economics constituted by the progress of digital information networks. For instance, the conceptualization and operation of innovative platform businesses on the electronic market and the factual existence of entrepreneurial knowledge-workers in self-designed open networks are tightly intertwined. Hence, the corporate transformation process towards open network management hinges in several ways upon the ability to attain constructive feedback from these entrepreneurially missioned organizational spaces. Simultaneously, this has to be balanced against the requirements of these for optimum independence and extroverted engagement. A primary strength of the supplementary approach is founded on the fact that it builds upon existing multi-faceted networks and a strong manufacturing base.

References

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