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Command & Control in the Multidimensional Organization

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Abstract

Chandler's dictum 'structure follows strategy ... but the market is the common denominator' during the twentieth century was answered effectively by the one-dimensional multi-divisional organization, both in business as in government. Today's markets have a dynamic multidimensionality; customers having multiple preferences, dependent on time, day of the week, context of activities, and having a choice of information and distribution channels. To be in-control in such market requires multidimensional management accounting systems. Resources have changed from physical to uncodified personal knowledge and resourcefulness. With that the basis of motivation of workers is changing from being position oriented to contribution oriented. The resource allocation process has to give way to resource mobilization. A number of firms effectively have answered this complexity by adopting a multidimensional organization. The paper explains how these firms are effective and by what social, administrative, and technical measures they have transformed traditional ideas about amongst others authority, control, management and rewards, to create organizations which prove to be effective in dynamic complex environments. Consequences for qualifications of executives and managers are discussed. The paper also discusses why the fundamental transformation these firms have accomplished implies a change in the paradigms of management of change and of organization design.

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The linear chain of command

In his *Organization* Ernest Dale (1967) lists the classical principles for organization. The first of the classical principles is that an organization must have an *objective* or objectives. The corollary to this axiom being that each unit in the organization should contribute to the attainment of the overall objectives and that each one should be given an (sub) objective, the accomplishment of which will make sure that the individual or unit does make a contribution to the overall objective. The second classical principle is *specialization*, which is that as far as possible the work of each person should be confined to a single function. The third classical principle is *unity of direction*. There should be one head and one plan for each group of activities having a common objective. The fourth classical principle is *unity of command*. Each person should receive orders from only one superior and be accountable only to him. The fifth classical principle is that of *parity between authority and responsibility*. A manager which is being held responsible for certain results should be attributed commensurate decision rights and control over resources to achieve those results. The sixth classical principle is *delegation*. “Each decision should be delegated to the lowest competent level—that is, to the lowest point in the organization where the incumbent of the position may be expected to be aware of all the factors pertinent to the decision and where the results on which he is judged will encompass all its consequences.” The seventh classical principle is *limited span of control*. No superior should have more than a specific number of subordinates. The eighth classical principle is *short chain of command*. This chain of command between the CEO and the man on the shop floor should be as short as possible. The ninth classical principle is *balance*. No part of the organization should be given, by size, budget or role, undue emphasis at the expense of others.

These principles have been criticized by many authors for various reasons. Especially academics have pointed out that these classical principles lack scientific proof. Despite all these criticisms these classical principles today still play a role in managing and organizing firms and institutions, often as a theory-in-use. Even more, explicitly or implicitly, these classical principles have been programmed (in the cybernetic meaning of programming (Beniger 1986)) in business institutions like management control, auditing, information systems, and in the cultures of many organizations and their (institutional) environments.

Another tenet in organization design is *fit-to-market*. Most famous is Chandler’s dictum: “Structure follows strategy ... but the market is the common denominator...” (Chandler 1962:382-3). Conceived by DuPont in 1918 (Dale 1960), Alfred P. Sloan codified this tenet into not only the structure of the multidivisional organization, or M-form, but especially in the workings of its internal governance (Williamson 1985). Implicitly this system of internal governance is based on the classical organization principles (Freeland 2001; Sloan 1962/1986). “In terms of its impact, not just on economic activity, but also on human life as a whole, the multidivisional organizational design must rank as one of the major innovations of the last century” (Roberts 2004:2). The M-form assumes the firm to exist as a portfolio of self-contained businesses and with that conceptualizes the firm as a portfolio of investment projects, between which only synergies exist with respect to financing the operations, for which it operates an internal capital market.

Despite its successes, the M-form is abandoned at a large scale (Strikwerda 2003; Strikwerda 2008). This abandonment however is somewhat Delphian. Today few multinational enterprises (MNE’s) can be found which do not operate one or more shared service centers for their divisions. The efficiency gain from these shared services is material, savings of up to 75% of the costs of finance have been reported for e.g. financial shared services (Bangemann 2005). As a consequence few divisions today are self-contained organized, contrary to the axiom of the M-form. The deployment of shared services does not affect the accountability of the manager of a division. The introduction of corporate account management however, is affecting the accountability and position of

the division management. A criterion for successful corporate account management is that the customer is defined as the primary profit center in the accounting system, at corporate level. Many CEO's or executive boards hesitate to make such a constitutional decision, as such a decision is a gross violation of the roles, identities and relations between managers and executive in the social system over the years as produced by the M-form. But many executives feel forced to do so because customers either source from multiple divisions, or in case of regional divisions, have themselves organized as one purchasing entity cross all the regional divisions of the supplier. In the case of shared service centers it turns out that savings are achieved, but often at a high costs in terms of deteriorating relations and increasing tensions between managers and a declining experience of job satisfaction.

The Delphian nature of the present changes in organization forms (to deploy shared services, to install corporate account management as a primary profit center) results from that such types of operational changes not automatically induce corresponding changes on the level of codified rules, in the system of identities of the members of the organization, in the system of relations between the members, neither at the conceptual level of thinking about organization; that is, operational changes are leading the mental changes with managers pursuing such operational changes.

In today's management literature we can read various proposals to introduce new principles for organization. An example is Doz & Kosonen (2007) who in their Harvard Business Review (HBR) article *The New Deal at the Top* plead for collective responsibility for corporate performance, interdependencies, overlapping experience and responsibility and emphasize normative control. Well known is Peter Drucker's (1988) article *The Coming of the New Organization* in which he predicts that the command & control organization will be replaced by an information based organization. Drucker is not specific on what in operational terms an information based organization will look like. In hindsight the various pleas published in the eighties and nineties of the twentieth century for abandoning the organization with a hierarchy according to Weber (1922), with its stove pipes, its linear chain of command (Dale 1967), are correct. The issue is that so far many organizations and perhaps even business institutions like controllers, human resources (HR), information systems management (IT), organization design, change consultants and others, have failed, in cybernetic terms, to reprogram the underlying paradigms, models, language and other implicit codifications of the classical organization principles. As a result of which the entrepreneurial intuitions for a new definition of command & control are not translated into the practicalities of every day organizational life; this will explain that new definitions of command & control are difficult to turn into practice.

The emergence of the multidimensional organization

In a research commissioned by the Dutch Foundation for Management Studies into the state of the application and its working of the unit-organization (the M-form) the author, discovered an organization form deployed by a number of firms which (a) apparently are successful (e.g. IBM, Microsoft, ASML); (b) did not fit any of the known descriptions of organization forms; (c) for which its management had no label. Literature research revealed that this form earlier, in the eighties of the twentieth century, was considered e.g. by now Royal Philips Electronics (Prahalad 1980). The tactics of the research simply was to ask the executive on what dimension (product, region, distribution, market segment) the accountability for profit in the internal organization was partitioned and attributed. Next questions would be asked on fit-to-market, use of shared service centers, corporate account management and other types of synergies to be exploited and so to explore possible causes of problems with the M-form. In a minority of cases executives or other managers interviewed responded that profit responsibility simultaneously was organized on multiple dimensions, customer, product,

region, distribution, etc. (Strikwerda 2008; Strikwerda and Stoelhorst 2009). An overview of multidimensional organizations identified in the research is given in Figure 1. On basis of additional field work by the author (on which for reasons of confidentiality no reports can be published at this moment) it is to be concluded that the multidimensional organization is relevant for law enforcement organizations, the military and government organizations.

Firm	Number of Dimensions	Dimensions
ABN AMRO	4 (+1)	Regions, Global Clients, Market Segments, Products, (Support Functions)
Ahold (Albert Heijn Company)	8	Time, Place, Formula, Category, Customer's Loyalty Card, Receipt, Regions, Branch/Store
ASML	2 (+1)	Products, Accounts, (Support Functions)
IBM	4 (+1)	Product/Solution, Regions, Accounts, Distribution Channels, (Support Functions)
Microsoft	4	Products, Regions, Applications, Market Segments
PricewaterhouseCoopers	2 (+1)	Industries, Professional Services, (Support Functions)
Van Hattum & Blankevoort	2	Business Units, Projects

Figure 1. Multidimensional firms identified in the Strikwerda (2008) research.

In view of the classical organization principles (as listed before, especially *unity of command* and *parity between authority and responsibility*), but also in view of what usually is assumed on organization, e.g. a univocal system of financial responsibility centers, and management processes, e.g. a bottom-up resource allocation process (Bower 1986; Lorange and Vancil 1977; Merchant and Van der Stede 2003) the responses of the firms listed in Figure 1 (accountability for the same results being simultaneously being organized on multiple reportable dimensions) evokes a number of questions. Who has bottom line responsibility for what? How are decisions made, who makes which decisions, how are resources allocated, how is performance managed, how management control, how is appraisal and remuneration organized, etc. In short what does the command & control, or whatever its functional equivalent may be, looks like and how does it work? Also, how did these multidimensional firms manage to change from their old M-form towards this multidimensionality, obviously remaining *in-control* during the change and thereafter?

An operational description of multidimensional organizations

A possible paradigmatic example of a multidimensional organization is IBM. Each Wednesday morning its product managers, account/industry managers, its region-managers and distribution managers all receive the same information on the turnover and income of IBM on each of these reportable dimensions. That is, IBM simultaneously is run: as if a portfolio of products as profit centers, as if a portfolio of regions as profit center, as if a portfolio of customers/industries as profit centers and as if a portfolio of distribution channels as profit centers. IBM and Microsoft emphasize in their Annual Reports that these reportable dimensions cannot be viewed as separable businesses. Reporting on each of the dimensions contains financial data, turnover and (gross) income or EBITDA (earnings before interest, taxes, depreciation and amortization), and non-financial data,

market share, share of wallet, customer retention, customer satisfaction. At first sight, when one talks with the managers in organizations like IBM, it appears that each of the managers is held accountable for the performance of IBM on the dimension assigned to that manager. That is the manager for products for the turnover and income of IBM on products, the manager for accounts/industries for turnover and income of IBM on those accounts/industries. At a corporate level the performances on each of these reportable dimensions is the same and is the performance of the corporation IBM (Figure 2).

YEAR IN REVIEW				
RESULTS OF CONTINUING OPERATIONS				
Revenue				
<i>(Dollars in millions)</i>				
FOR THE YEAR ENDED DECEMBER 31:	2006	2005	YR. TO YR. PERCENT CHANGE	YR. TO YR. PERCENT CHANGE CONSTANT CURRENCY
Statement of Earnings Revenue Presentation:				
Global Services	\$48,247	\$47,407	1.8%	1.7%
Hardware	22,499	24,343	(7.6)	(8.3)
Software	18,204	16,830	8.2	7.5
Global Financing	2,379	2,407	(1.1)	(1.6)
Other	94	147	(36.4)	(33.4)
Total	\$91,424	\$91,134	0.3%	(0.0)%
<i>(Dollars in millions)</i>				
FOR THE YEAR ENDED DECEMBER 31:	2006	2005*	YR. TO YR. PERCENT CHANGE	YR. TO YR. PERCENT CHANGE CONSTANT CURRENCY
Industry Sector:				
Financial Services	\$25,181	\$24,186	4.1%	3.8%
Public	13,401	14,064	(4.7)	(5.3)
Industrial	11,535	11,699	(1.4)	(1.6)
Distribution	9,034	8,959	0.8	0.3
Communications	8,679	8,601	0.9	0.6
Small & Medium Business	16,981	17,597	(3.5)	(3.8)
OEM	3,856	3,271	17.9	17.9
Other	2,756	2,757	(0.1)	0.0
Total	\$91,424	\$91,134	0.3%	(0.0)%
* Reclassified to conform with 2006 presentation.				
<i>(Dollars in millions)</i>				
FOR THE YEAR ENDED DECEMBER 31:	2006	2005	YR. TO YR. PERCENT CHANGE	YR. TO YR. PERCENT CHANGE CONSTANT CURRENCY
Geographies:				
Americas	\$39,511	\$38,817	1.8%	0.8%
Europe/Middle East/Africa	30,491	30,428	0.2	(1.1)
Asia Pacific	17,566	18,618	(5.7)	(3.1)
OEM	3,856	3,271	17.9	17.9
Total	\$91,424	\$91,134	0.3%	(0.0)%

Figure 2. The revenue of IBM reported on three dimensions (IBM Annual Report 2006, p. 22).

The representation of the data in Figure 2 illustrates that the managers for the product dimensions, those for the industry-dimension and those for the regions are responsible for the same revenue. But each is so from a different perspective, from different competences.

When it is about a collective responsibility for the same performance, the format of reporting matters to enable this collective responsibility. In working with a number of engineering firms on implementing cross-unit (global) account management, it was found that cross unit account management only works if the customer is defined as the primary profit center, in addition to which profitability of each of the units is reported. Reporting the profitability on each of these dimensions

was of little consequences, but reporting in the format depicted in Figure 3 made a difference in the team-meetings between business-unit (BU)-managers and account managers. What the reporting format in Figure 3 basically does is that it connects the BU-managers and the account manager by one objective function (maximizing EBIT (earnings before interest and taxes) of the firm) and one shared calculation, which each of them can understand. On basis of which each of the team members can conclude what his and other's contribution is to the common performance.

Account- en cross selling planning firm SYNERGY											
Year 2008 (Dollars in millions)											
	BU A		BU B		BU C						
	Revenues	Direct costs	Revenues	Direct costs	Revenues	Direct costs	Gross margin	costs CAM	SG&A-costs	Depreciation	EBIT
Customers BU A	80	60					20	0,0	9,4	4	6,6
Customers BU B			130	120			10	0,0	12,2	8	-10,2
Customers BU C					70	60	10	0,0	6,8	1,7	1,5
Account AB	12	7	10	6			9	0,4	2,3	0,6	5,6
Account BA	10	5	10	8			7	0,4	2,1	0,6	3,9
Account CB			10	6	12	6	10	0,4	2,1	0,1	7,4
Total	102	72	160	140	82	66					
Gross margin	30		20		16						
costs CAM	0,44		0,6		0,24			1,28			
SG&A-costs	12		15		8				35		
Depreciation	5		8		2					15	
EBIT	12,56		-3,6		5,76						14,7

Figure 3. An example reporting sheet on BU-performance and customer performance (based on a number of engineering firms in the Netherlands) (CAM = corporate account management, SG&A-costs = sales, general and accounting costs)

More in general a shift going on in business from managing on basis of tacit assumed causality located in the brains of an individual manager or shared through culture, to explicit, verified and shared causality by the organization (Davenport and Harris 2007; Kaplan and Norton 1996; Kaplan and Norton 2004). The now explicit causality especially in the new business models adopted by firms is defined in multiple dimensions for four reasons. The first is that customers display multiple behaviors towards suppliers, both in B2B (business-to-business) and B2C (business-to-consumer). These multiple behaviors are with respect to how they buy (B2B, financial services), direct, indirect, by choice of channels. Consumers in retail display multiple sets of preferences dependend on time, day, place of purchase. Also there is a shift towards network industries (Shy 2001), these are industries in which the consumers purchase system components from different independent suppliers to assemble these at the place of consumption or use (e.g. at home), which implies a change of the locus of value creation towards the market, away from the jurisdiction of the firm. *These changes in the environment of the firm imply an increase in the variety of that environment, with respect to behaviors, preferences, competitive behavior, tactics etc. To this applies Ashby's Law of Requisite Variety (Ashby 1956). This laws states that the system (environment) that has a larger variety available in its behavior and decisions, will master (control) that system (a firm) which as a lower variety of responses. Therefore, in order to be in-control in its market, a firm needs to be able to effectuate a larger number of tactics, actions, etc, as its customers and competitors are able to effectuate. A first requirement for this is to have a higher number of informational dimensions as are presently used by customers and competitors. Wal-Mart is an example of a firm answering the requirement of requisite variety on its customers based and supplier's base.*

The second reason to manage by explicit cause-and-effect relations is that new business models do not replace old business models but are added to existing business models, while at the

same time it is impossible to define perfect cause and effect relations (March 2006). So pursuing a performance of a firm simultaneously along multiple dimensions is like triangulation in the field to establish a position by compass, to reduce the risk of being wrong.

A third reason for multidimensionality is that the modern firm needs to exploit multiple types of synergies, especially customer synergies and knowledge synergies to create maximum return on knowledge as an asset.

The fourth reason for multidimensionality has to do with the dimension of time. In the traditional unit-organization, managing the short term performance (which usually is organized in the BU) was separated from managing the long term (usually organized in the R&D-department). In the economy of the 21st century knowledge is not only created in R&D-departments, as much knowledge is created by applying existing knowledge to *de novo* problems of customers (Boisot 1995). That is, knowledge as much is created in the business unit. Hence the strategy of a number of firms to pursue co-creation with customers to create more value (Prahalad and Ramaswamy 2004). This coincides with the development in which creative workers, as carriers of uncodified, personal knowledge have to divide their time on revenues today and activities to ensure revenues tomorrow, and often through cross BU-projects. This also reflects that, due to the declining costs of information, conduct-level strategy converges with operational management. To manage both time and resources in this new constellation Kaplan & Norton (2008) have developed and applied a new method for strategy execution. Their method implies a multidimensional accountability, on the dimension time, as well on the contribution of individual BUs to cross-BU projects.

Because in the multidimensional organization the management of market opportunities (account management, industry management, market segment management) is separated from the management of resources (product management, manufacturing, shared services), the multidimensional organization also is an answer to the increasing agency costs in the traditional organization (Jensen 2001b), to which is connected the failure of Bower's widely applied bottom-up resource allocation process (Bower 1986; Bower and Gilbert 2005a).

So what we see is the emergence of the multidimensional organization as a response to a number of exogenous developments (Strikwerda 2008; Strikwerda and Stoelhorst 2009):

- Globalization of markets over regional markets
- Increasing complexity in customer behavior
- Increasing complexity in products, services and solutions
- A shift of the locus of knowledge creation and development of solutions towards the interface with the customer and in the market itself (network industries)
- A shift from codified general knowledge towards uncodified personal knowledge
- A shift towards business models based on continuous creation and exploitation of knowledge, and based on exploiting customer synergies and knowledge synergies
- A shift from motivation of workers based on control over resources towards motivation based on an acknowledged contribution to the common goal
- Creative knowledge workers seeking as large as possible personal market (Rosen 2004)
- A decline of the costs of information (Jorgenson 2001)

It must be noted that sometimes members of an organization, or observers like academics and consultants tend to think of functional lines, e.g. HR, finance, IT, logistics, as separate dimension to those of products, regions, customers etc. In a way these functional lines are separate dimensions,

but these are not *reportable dimensions* with respect to the overall revenue and income of the firm, as (groups of) customers are, products, regions, distribution channels etc.

The multidimensional organization in administrative decisions

At first sight a multidimensional organization does not differ by structure (internal organization form) from the traditional multinational enterprise (MNE). One will see (product) divisions, regional organizations, shared service centers, account management, etc. Especially most multinational enterprises, e.g. Royal Philips Electronics N.V. have multiple dimensions: by legal structure their organization (national subsidiary structure) is different from their business structure (global product divisions). Many executives intuitively want to understand their business on multiple dimensions because they feel that else their agenda is set too dominantly by the structure of the internal organization (Hammond 1994), jeopardizing the maintenance of the fit-to-market of the firm and the sensing of new market opportunities.

An intermediate step between the traditional organization forms and the multidimensional organization are those firms of which the management information systems are based on multidimensional databases and allow for diagnostic control on dimensions in addition to the dimension (usually that of the product divisions) of its management control system. Such an intermediate situation in general will be useful not only to be in-control, but also as an instrument for change, to accommodate managers and others to learn to work in a multidimensional environment. An example of such a firm is the Swiss based multinational Nestlé.¹

In a multidimensional firm, its objectives (strategic and financial) are pursued simultaneously over multiple dimensions, on each of which the performance is reported weekly or monthly broad in the organization (no information asymmetry), for each dimension a manager is accountable and held accountable for the contribution of that dimension to the overall performance of the firm, and all these managers depend on each other with respect to resources needed to accomplish their contribution.

This is a descriptive, operational definition of the multidimensional organization form. From the research it can be concluded that the firms, in varying degree of perfection and completeness, made the following administrative decisions to create a multidimensional organization.

First a mission was formulated emphasizing the need for integrated solutions. In the case of IBM its transformation towards a multidimensional organization started in 1994, when IBM was in a crisis and it was being contemplated to break up IBM (similar to what ATT did). Breaking up IBM did not sit easy, with neither its managers, workforce or its environment. So the then new CEO Gerstner, changed the strategy of IBM to “Offering integrated solutions” and pursuing global account management. Till then IBM was a product-centric firm and its international organization was based on the geographical model, with country managers having a key position in the system, including profit responsibility. In the case of the retailer Ahold not a new mission was created, but the objective of growth in view of an growing variety of different preference sets with individual customers (dependent on time of the day, day of the week, and context of purchasing, utility, leisure or travel) induced the policy to serve such customers in their variety of preferences. In the case of the Swiss firm Nestlé the objective of the then CEO Brabeck was, given a decentralized organization, country organization as profit centers, global customers, etc. to be *in-control*. The new IT system GLOBE would allow Nestlé to know, at the touch of a computer key, how much it sold, product by product to international customers like Carrefour and Wal-Mart, etc.

¹ A large number of cases have been written and published on Nestlé, e.g. HBS-cases 509-001 and 509-057 (2008) and IMD 3-1334T (2008).

Second, a set of values was defined or already was in place. In different degrees these values have a hierarchy. In general for a multidimensional organization a typical value is that the whole is more than the sum of its parts. This implies that winning an order is of higher hierarchy as is the performance of an individual dimension. Also, a value is that the manager, e.g. a product manager, who gives in, in terms of price on a product, in order to win an order for an integrated solution, is rewarded for doing so, not punished. The multidimensional organization implies a shift from managing by objectives to managing, not so much by values, but within the context of a hierarchy of values.

Third, at the level of strategy typical the constitutional decision is made to make the individual customer the primary profit center and to make a manager accountable for the revenues, income and a number of non-financial performances, especially customer satisfaction of that customer. Either profitability is defined per individual corporate account, or customers as profit center are grouped in market segments. The account manager nor the market segment manager controls the resources need to achieve his or her targets.

Fourth, at the level of the executive board it is decided that corporate accounting (control) is mandated to standardize semantically the fields of the record of the general ledger and transaction systems, that the general ledger is extended to include cost to activity recording in a multidimensional way, and that all entities of the firm, irrespective of jurisdiction must make use of this standardized extended general ledger. In doing so a multidimensional data base is created. This standardized extended general ledger must be capable to consolidate revenues and (gross) income on multiple dimensions (customer, product, investment project, legal entities) in an automated way.

Fifth, the executive board decides that information, taking into some policies with respect to security and protection of trade secrets, is available to all key managers in the firm. This decision includes that customer data no longer is owned by e.g. a business unit, nor by the account manager. If a product manager at IBM thinks he sees an opportunity with a customer, he may present this, but as an integrated business case, including all the costs and aspects of marketing, account management etc., because he has access to the relevant data. This is to say, the executive board bans or reduces the information asymmetry which is typical for the traditional hierarchic bureaucracy.

Sixth, the executive board decides that business cases, income on customers, on products etc. are based on integral consolidation of revenues and costs, by corporate accounting, that is no longer on transfer prices between e.g. product management and account management. Cross-border transfer prices for fiscal authorities will be recorded and reported. By eliminating transfer prices from the internal coordination, allocation and decision processes the double mark up, resulting in sub-performance of the firm is eliminated (Brickley, Smith, and Zimmerman 2001:482-486). Also, the elimination of transfer prices is an important factor in having creative workers cooperating in an interactive way to create new products and services.

Seventh, executive boards, whilst maintaining the traditional budget structure, tend, in varying degrees, to overlay this, or cross this with thinking in business models, causal relations, sometimes expressed as process management, having calculation models shared etc. Methods for this are Kaplan & Norton's strategy map, be it that in a multidimensional organizations causal relations also need to be seen as reportable dimensions in terms of revenues and income, respectively contribution to the overall goals. The communication of causality sometimes is a problem. The concept of the strategy map lends itself for communication in the organization, less do so new business models.

Eighth, executive board change the planning & budget method from the traditional model for resource allocation (Bower 1986; Merchant and Van der Stede 2003:334). Typically first those responsible for market opportunities will be asked to propose targets and plans which then will be challenged, under supervision by the executive board, by those responsible for technological opportunities and the managers for resources utilization, respectively return on investments. This is to

ensure that those assessing market opportunities will not show satisfying behavior, respectively risk averse behavior with respect to return on investments. This planning process sets requirements to the executive board itself, especially to manage explicitly the tension between market opportunities and resource utilization, but this is the corollary of the need to reduce internal agency costs.

Tenth, the executive board will select a different type of (senior) managers compared to those selected for the unit organization. It will select managers whose motivation is not based on control over resources, but is based on a by the community (organization, industry) acknowledged contribution to the performance and the development of the firm. Also, the executive board will select managers who have the capability to oversee the system, the working of the firm, and therefore are resourceful to get those to the table as needed to address an issue, without calling in hierarchical authority.

Eleventh, the variable compensation is based on corporate performance, not on unit performance and it includes the contribution to cross-unit activities (Bower 2003).

Command & control in the multidimensional organization

Now we have an operational understanding of the multidimensional organization and understand through which constitutional-administrative decisions unit-organizations are turned into multidimensional organizations, we might attempt to understand the multidimensional organization in terms of command & control with a view on the publications of Alberts *et al.* (Alberts and Hayes 2003; Alberts and Hayes 2006; Alberts and Nissen 2009). In business command stands for the separation of thinking, making decisions and doing, as introduced by Frederic Taylor's scientific management. Command in business was around 1900 management by instructions (MBI or *Auftragstaktik*). The worker was told what, how, where, and when to perform which act on which he had little discretion. Control in business initially was the French *contrôle: c'est-à-dire veiller à ce que tout se passe conformément aux règles établis et aux ordre donnés* (Fayol 1918/1999:8). Also, control of the firm and its workers was based on a partitioned application of Roman property law: the right to uses assets was delegated (*ius utendi*), but not the *ius fruendi* and neither the *ius abutendi* (Furubotn and Richter 2000:77) The firm could in a simple way enforce its *ius abutendi* over its assets, because these assets were physical of nature or otherwise clearly defined, e.g. patents. Further, control over workers was exercised by firm idiosyncratic work methods, tools and standards, which made it difficult for the experienced and trained worker to develop negotiating power vis-à-vis his employer. When after WWII the economy required more decentralized decision making (Hayek 1945), MBI—and thus the style of command—evolved into management by objectives (MBO) providing department or unit managers more discretionary powers *how* to achieve an agreed objective (what to achieve). MBO was based on a psychology of achievement, identification with the products and technology of the firm (Simon 1987) and the acknowledgement of tacit knowledge aka human capital. Objectives were abstracted into financial performance, which allowed changing control from the *contrôle* towards the cybernetic feedback based management control, including loops for self-control. Implicitly the system of MBO was based on general, codified knowledge, and thus based on low information asymmetry in the control function and subsequent little agency costs, which was also achieved by double control mechanisms. Also the MBO-system was based on a unitary allocation of decision rights, tightly constrained patterns of interaction and a tight control over distribution of information (Alberts and Hayes 2006:75).

The MBO system at corporate level developed in conjunction with the system of financial holdings in the eighties. Executive boards would hold the management divisions accountable for financial

performance only, as if shareholders, leaving the management of divisions free how to achieve set financial targets (Goold and Campbell 1987). Command developed as a principal-agent relation, and control into (tight) financial control. In strategic architecture or strategic control type corporations command existed in defining, often in cooperation with the management of the divisions, a corporate strategy, which then was translated into strategic and financial goals, and limits for investments and working capital for each of the divisions; command developed into agreed strategic plans. These divisions then were supposed to elaborate business plans and budgets *how* to achieve the top-down set targets, which then were presented to the executive board, having discretionary powers over the internal capital markets and available external capital. Between the divisions and the executive board a brokering process would determine how available corporate resources would be allocated to budget / investment plans of divisions: Bower's bottom-up resource allocation process (Bower 1986).

The interesting issue is that in Bower's bottom-up resource allocation process it was assumed that a new strategy also would be translated into what Bower labels *systemic context* (Bower 2000:87). This systemic context can be seen to consist of the elements as depicted in Figure 4.

Mission
Value hierarchy
Vision / premises
(Strategy) = common / corporate goals
The business model, cause-and-effect relationships
Performance measurement: on what dimensions performance and position of the firm is being measured and reported, on what parameters, including strategic themes, cross unit projects are measured, etc.
The process of deployment of targets, conflict resolution between market opportunities and resource utilization and resource allocation
Available management information, historical, future oriented, financial and non-financial, leading and lagging parameters
The process of (interactive) control and performance evaluation
The system of rewards
Management development programs Training, coaching
The process for premise control / meta-control

Figure 4. The elements of the *systemic context*, adapted from Bower, 2000:87.

Bower assumed that through the systemic context conditions are created in order that managers will develop such a behavior, expressed in new and innovative initiatives, in order that (new) strategies will be executed effectively. This is to say, the behavior of management of divisions, business units, lines of business etc. not only is controlled through command, in whatever form and style, as much behavior of unit managers is controlled by the elements summarized in Figure 4. Apparently the control over behavior of managers by the systemic context is stronger as is the command by the context of new strategies, to the effect that the failure of firms to execute new strategies is ascribed to systemic contexts not adapted to new strategies (Bower and Gilbert 2005a:Part II. When the Bottom-up Process Fails; Jensen 2001a; Jensen 2001b; Kaplan and Norton 2008) Therefore Bower and Gilbert (2005b) have proposed a revised model for their bottom-up resource allocation process.

In this revised model, the adaptation of the systemic context precedes the process of (strategic) targets down and plans up (Figure 5) in order to facilitate new strategic behavior, resulting in new types of initiatives to execute new strategies effectively.

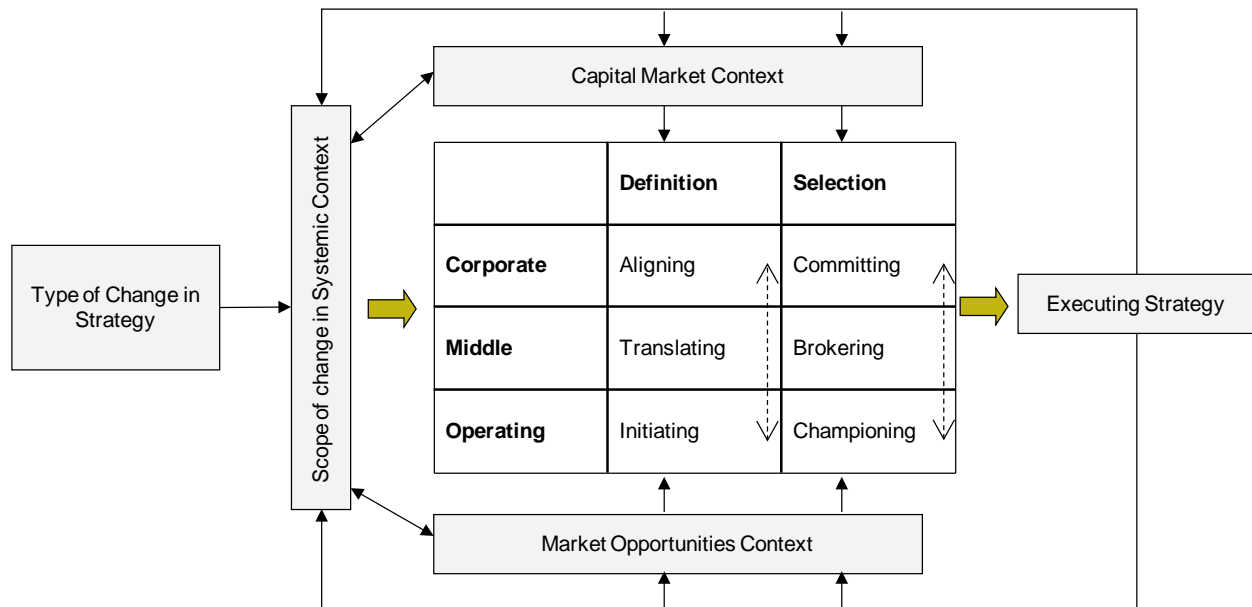


Figure 5. Strikwerda, 2010 *Execution: creating new innovative strategic behavior*, NNC Annual, Adapted from Bower, Joseph L. and Clark G. Gilbert. 2005. "A Revised Model of the Resource Allocation Process." in *From Resource Allocation to Strategy*, edited by J. L. Bower and C. G. Gilbert. Oxford: Oxford University Press.

In a way the revised model for the bottom-up resource allocation process acknowledges that, due to the increasing variety in the environment and in operations, a directive type of command (*Auftrags-taktik*) is in itself insufficient.

What we see in the case of the multidimensional organization is that its executives, in different degrees of completeness, by constitutional / administrative decisions change the systemic context of their managers and workers, they are less involved with redesigning the basic structure in terms of business units, regions, of their organization.

In one case, ABN Amro, the in 2007 largest financial institution in the Netherlands, its executive board decided to change towards a five dimensional organizations. In implementing this decision emphasis was placed on values and on cooperation. For the latter this bank embarked on a culture program. It was decided to postpone the issue of management information, although this bank had available a corporate wide CRM-system in which all its customers, large and small, were recorded on a comparable way. Also it was decided to postpone the adaptation of the reward system, partly because some of the bonuses were as high as 300% of the base salary on the performance at unit level. This bank at the moment of this change suffered lack luster performance for the past five years. The organization managed to manage, especially with the help of their CRM system the increasing complexity of customer behavior, but suffered problems in their decision making process, managers tended to delegate upward all issues to the executive board. Management information needed to write integral business case failed or was difficult to come by. So the implementation was judged difficult. Due to their lack luster performance one of its shareholders, The Children Investment Funds from London, broke in to the result that finally the bank was broken up. In hindsight it was understood, especially compared with the case of the Deutsche Bank (which runs an effective multidimensional information system), that priority should have been given to the systems for management information (but also that it is unlikely that shareholders would have allowed ABN Amro sufficient time to accomplish this).

With respect to the nature of control in the multidimensional organization, it is to be noticed that the elimination of information asymmetry changes the nature of control. With the move towards the MBO control changed from *contrôle* to cybernetic, feedback based control. *Contrôle* is to

compare e.g. the number of physical stock of a good in the warehouse with what is recorded in the books of the firm with respect to this stock. Cybernetic control is about the exchange of information between a system (biological system, social system, an organization) and its environment and the processing of this information to survive, to accomplish a predetermined goal, to adapt to changes in the environment in order to survive and to accomplish its predetermined goal and to re-program the control (as this is programmed in DNA, nervous systems, culture, organization structure, management techniques, technology) in order to survive and to accomplish predetermined goals in view of new contingencies. With that it is acknowledged that control, as understood in cybernetics has three levels: *existence or being* (avoid increase of entropy), *experience or behavior* (adaptability to variations in the environment) and *evolution or becoming* (the capability for re-programming, transformation in view of fundamental changes in the environment) (Beniger 1986).

The feedback in the cybernetic control model is not without problems in the context of social organizations: imperfect measurement of performance, timing issues, cooking the numbers, are only some of the problems with traditional control. By eliminating information asymmetry in the organization, in combination with an understanding of causal relationships, the nature of control moves away from the hierarchical, principal-agent relation type of control towards a panoptical type of control; whatever a manager decides, his environment will observe that decision immediately as well its effects. This is the type of control which is to be observed in the open source movement, gaming and in wikinomics between the participants in such social systems (Beck and Wade 2006; Himanen 2001; Tapscott and Williams 2006). Workers not only seek an income through their work, but as much they are looking for respect, identity, reputation, self fulfillment and acknowledgement of their contribution by a selected and defined community. Whereas in the organization of the second industrial revolution control was based on the self as an interchangeable group member with social identity salient, in the organization of the information age the self is considered as unique with personal identity salient over social identity. Control used to be based on identification with the firm, whereas now workers identify with one's profession, and other selected groups in society. Control used to be based on assumed motivation as e.g. Maslow's hierarchy of needs and McGregor's simplified theory X versus theory Y models of man. Sources of motivation today are more varied today as in the past, between individuals and with individual persons. In a way it was acknowledged during the eighties and nineties of the twentieth century that management directed control and even bureaucratic control needed to be replaced with employee centered control. In employee centered control managers and supervisors influence the way that people think about their own ways of behaving (Rollinson and Broadfield 2002:543). This employee centered control however was clouded by the financial markets induced control revolution of the eighties and nineties, pressing for (tight) financial control and related process controls. Understandably authors from the field of management control defined cultural controls to achieve at a complete system of control (Merchant and Van der Stede 2003). Even more because of the decline in the traditional methods for control, amongst other due to the growth of specific knowledge, uncodified knowledge, personal knowledge and an increasing level of variety in business, after the failure of cultural control competence management was tried as an control-technique (Durand 2004). Cultural control is problematic as it is hegemonic as cultural control is aimed at controlling heart and minds to induce employees to think the way managers want them to think, including to achieve control over employees emotions, insidiously robbing individuals of their humanity (Bradley, Schipani, Sundaram, and Walsh 2000; Rollinson and Broadfield 2002:552-562). The attempt to combine financial control and employee centered control has resulted in hybrid organizations, wherein an iron fist of strong and centralized control is wrapped up in the velvet glove of consent, combined with general guidelines, which softly and progressively erode the autonomy of individuals, while securing their consent to new forms of internal governance by which they increasingly regulate themselves (Courpasson and Clegg 2006). The ineffectiveness of

this hybrid models can be concluded from publications on the increase of agency costs within the firm and the failure of internal control (Bower and Gilbert 2005a; Jensen 1993; Wall 2006).

The combination of the multidimensional organization and the emergence of the use of explicit cause and effect relations (Davenport and Harris 2007; Kaplan and Norton 1996; Kaplan and Norton 2004) overcomes the hybrid control organization. It does so through a number of mechanisms, mission, values, explicit business model/causality, panoptic feedback, equitable rewarding, financial and by reputation. Especially two aspects are different. In the first place the multidimensionality creates a performance measurement infrastructure universal for the whole firm which enables its managers and workers that base compensation and title move with the workers as he or she shifts roles (Bower 2003). The multidimensional organization with its performance measurement infrastructure is an appeal to the creative workers and manager to interpret, in view of the overall goal and in view of the hierarchy of values both external and internal material information and to turn it into eidetic information and to turn this eidetic information into initiatives and decisions. So both the sensor functions and the sense making functions, not only are moved to the edge of the organization, it is mobilized all over the organization. Hence we see that the emergence of the multidimensional organization goes hand in hand with a shift from resource *allocation* to resource *mobilization* (Doz 2005). This resource mobilization should be seen as a characteristic of Alberts & Hays' concept of the *Edge Organization*.

By making the information space independent from both the bureaucracy as a cybernetic program and from existing implicit or explicit business models (Davenport 1998), it is acknowledged in the multidimensional organization that control explicitly must allow for continuous re-programming of the firm in order to be in-control (which we also find in the observation that the today's basis for the competitive position of the firm is its capability to innovate and therefore is continuous innovation).

In the multidimensional organization control is based not, like in cultural control or in competence management, to influence the way members of the organization think, but it is based on the capability of workers to think for themselves and their eagerness to solve *de novo* problems. This doesn't produce anarchy, nor an unbalance between what Simons labels rings and ladders in the coordination process (Simons 2005). A new order results because, to follow Ulrich Beck, "in the old system of values, the self always had to be subordinated to patterns of the collective, the new orientations towards the 'we' are creating something like a cooperative or altruistic individualism. Thinking of oneself and living for others—once considered by definition contradictory—are revealed as internally and substantively connected with each other. Living alone means living socially." (Beck 1999:10-11). Whereas in the modern organization of the twentieth century pride and respect of managers was based on position and control over resources, the worker of the twentieth first century is more sensitive to pride and respect based on both career commitment and on group-based pride and respect. Workers not only are individual-serving, but as much group-serving, display organizational citizenship, loyalty, rule-following behavior, and extra-role behavior or pro-social behavior (Haslam 2004:78). These groups are not closed groups by information. Due to the Internet and other means of communication and due to lower costs of transportations, individuals increasingly see themselves as members of multiple groups and identities in society. To the extent that employers see themselves faced with the question, not whether an individual fits into their organization, but whether their organization in terms of values, sign value and symbolic exchange fits into the self-image of the worker.²

² However, the role of values as meant here is quite different from that assumed in the Values Based Management from the populare management books.

Control in today's and tomorrow's organization needs to be seen in the context of the cyberspace. The concept of cyberspace metaphorically is used to describe a world composed by a digital representation (symbols, images) and communication through multidimensional, complex and fluid networks (Mul 2005). In this cyberspace individuals not such much are concerned to find their way into it, but first and for all find themselves in the need to define their own reality. Also the information in this cyberspace exists of two types (Lash 2002). The first type of information is discursive information, which is abstract, selective, simplified, reducing complexity, valid over large stretches of time and space. This type of information consists of amongst others scientific knowledge which assumes an academic training of workers to process this type of information and to act upon it. The second type of information in the informational society is disinformation. This is information with an ephemeral nature, which does not allow for reflection. Disinformation is culture, it is information without logical nor existential meaning, but it molds the postmodern man, his motivation, identity and identification. The information space of the multidimensional organization, made up of goal-information, axiological information, material information on its environment, shared eidetic information, effect-information and pragmatic information, all of a discursive nature, at the same time is transected by a space of disinformation, generated within and outside the organization. The point is that disinformation is the unintended consequence of discursive information, or traditional management information. "The information society has for its unintended consequences the information culture. The rational control of reflexive accumulation has as its consequences the out-of-control anarchy of information diffusion" (Lash 2002:146). Members of an organization are exposed to both the discursive information space of the organization and the space of disinformation as a result of which the (cybernetic) control intended by the discursive information space of the multidimensional organization is not straightforward.

In the bureaucratic organization of the twentieth century the informal organization was needed for commitment of the individual to the goals and to the working (control) of the formal organization, and was needed to protect the individual from the disintegrating effects of the formal organization on the personality and self esteem of the individual. We now can understand that the nature of the informal organization has extended to the space of disinformation and information culture. Through this extended informal organization of the firm, the control of the firm is extended to the world of the media, as workers base their identification and thus commitment not only on exchange value for their contributions, but as much for sign value and symbolic exchange (Poster 2001:60). The cases of IBM and Microsoft therefore suggest that being values based or driven as an organization is a necessary but not sufficient condition to be in-control in the cyberspace, what makes the difference is an administrative infrastructure as explained here before, in which individuals, especially creative knowledge workers feel safe to interact with others.

Change processes

In the twentieth century change was considered as an exception, a disturbance of the stability of the organization, a stability which needed to be maintained. Change and the need for change was acknowledged in e.g. Parsons theories of society, but it was based implicitly on stability of the institutional context (Parsons 1962). With that the traditional methods for organization change and implementing change (Bennis, Benne, and Chin 1962; Carnall 2003) assumed an institutional stability. The issue in the present information society is that this institutional environment itself is changing or should be object of change (Beck 2002; Williamson 2000). Change focused on individuals and groups, to have changes in structure accepted, feedback on quality (TQM), breaking ineffective routines and introducing time horizons by working on basis of projects, being customer oriented in-

stead of oriented on the boss or routines, to accept decentralization, to accept performance management, etc. Tactics for change predominantly were anthropocentric, usually for reasons of information asymmetry, due to the then existing costs of information, and costs and capabilities of communication channels. These predominately anthropocentric tactics for dealing with resistance to change assumed the legitimacy of the manager as position holder, in which both the position and attributed decision rights were dealt with as if property rights. Now property rights shift towards (creative) knowledge workers and so does the power base in the organization. In their *The Critical Path to Corporate Renewal* Beer, Eisenstat & Spector (1990:61) make a distinction between two approaches for organizational change and transformation, one labeled *programmatic change assumptions* and the second labeled *task alignment assumptions*. In the first it is assumed that to be influenced behavior (initiatives, coordination, control) is a function of individual knowledge, attitudes and beliefs and that the individual develops this knowledge more or less independent from the social relations he or she participates in. Therefore the primary target of renewal should be the content of attitudes, and ideas, sought after behavior will result from that. Subsequently the focus of change processes and managing change is the individual. Which can be seen in management development programs, training, etc. The *task alignment assumption* holds that individual knowledge, attitudes and beliefs are shaped by recurring patterns of behavioral interactions, which are social patterns. Subsequently this school sees organization structures, including temporarily ad hoc constructions like customer teams task forces etc. by which social patterns are changed, as the instrument to change individual knowledge, and subsequently behavior. Leaders were supposed to belong to the category of *programmatic change assumptions* and managers and workers to the category of *task alignment assumptions*. Indeed the implicit role of structure in the Weberian bureaucracy, because this structure monopolized knowledge and information, was to influence the thinking of individual workers and managers. Due to the modern digital information and communication technology the structure in the Weberian bureaucracy has lost this role, reinforced by the increasing mobility of creative workers in the labor market. The cultural programming of managers and workers has shifted from the weberian bureaucracy towards institutions for professional training, coaching and other to the firm external factors, including the Internet.

Also the nature of change as understood in the traditional management books on change is changing. Due to the declining costs of information, the conduct level of strategy and subsequent strategy as adaptation (product portfolio's, product design, pricing, positioning) has converged with operations, as predicted by Arrow (1974). The change of organizations today more is about the third level change as labeled by Beniger: redefinitions of economic models, of business models, and thus the transformation of cause and effect diagrams. Core in change is redefining the objective function of the firm, including constraints of various kinds, amongst which those implied by the mission and the hierarchy of values of the firm. In his paper *Informational Structure of the Firm* Arrow (1985) refers to the *information structure* of the firm as the assignment of signals to the agents (managers, workers who make decisions and carry out actions) and the *decision structure* as the choice of decision rules. Under the conventional command & control this information structure would be limited due to the costs of information, both to generate these and for the individual manager to select relevant data for his decisions. In the new dynamics of the informational economy in which innovation is the basis of competition, knowledge is created distributed through the organization and especially in interaction with its environment. The information that signals managers when and how to reprogram their part of the business, not only is generated by central strategy department (as far these still exist) but as much at the edge of the organization, in interaction with customers. Modular organizations allow for decentralized innovation of processes without the risk that the overall system will be destabilized (Baldwin and Clark 1997; Eisenhardt 2002). The decision structure is changing from old performance management, based on translating the top-level organizational objective into sub-objectives and incentives for lower-level decision makers, towards informing members of the organization on the objective function, cause and effect, providing access to information and equity

based incentives for making a contribution to the achievement of the objective function. Therefore management and managing change converge, based on controlling the objective function against a mission and changes in the environment and allowing, through initiatives as many as possible workers to identify new efficient operations.

Conclusion

To answer a number of fundamental changes in the economy and in markets, a number of firms have found effective responses to these changes by replacing the classical organization principles by a set of specific administrative decisions, which are not firm nor business specific. These administrative decisions may turn out to be the principles for organization in the twenty first century. These administrative decisions or principles answer specific institutional requirement with respect to be accountable, annual reports and the requirement to be *in-control*. The concept of the multidimensional organization is consistent with Ashby's Law of Requisite Variety (Ashby 1956), as it is with economic theories of information. Even more, the evolution of the multidimensional organization is consistent with changes in the social life, with respect to basis of motivation, new social structures, new self images, etc. The concept of the multidimensional organization is in deep conflict with the concept of organization (*unity of direction, parity between authority and responsibility, information monopoly by office holders*) as codified in the body of knowledge of professions, e.g. accountants and controllers. Command or even leadership in the multidimensional organization is of a different content compared to the twentieth century, but is consistent with the shift from mechanical causality (causality by physical force) in social life to structural causality (causality by values, understanding and information) (Lash 2002). The multidimensional organization especially is a challenge to the present generations of leaders and managers, most of which still are trained in the concepts of command and control from the twentieth century. Drucker in 1988 pleaded for the end of the command & control organization, to be replaced by an information based organization. The multidimensional organization confirms Drucker's foresight in that the multidimensional organization is information based. But as control, in cybernetic sense, is essential for the survival of our social-economic systems, for society itself, control is not replaced; the way control becomes programmed in our culture, institutions, organizations, worldviews, attitudes, etc. is changing. Command is evolving from being commander centered to being codified in missions and in values as an axiological context to pursue operational objectives and interpret pragmatic information. The multidimensional organization, through its combination of an axiological space, a performance measurement infrastructure and an information space which is independent of position holders, creates a space of confidence and trust for creative knowledge workers to interact with each other, to be mobile and to mobilize themselves on issues to be solved. That will bring the most out of society's most valuable resource: human capital.

References

- Alberts, David S. and Richard E. Hayes. 2003. *Power to the edge: command, control in the information age*. Washington, DC: CCRP Publication Series.
- . 2006. *Understanding command and control*. Washington, D.C.: CCRP Publications.
- Alberts, David S. and Mark E. Nissen. 2009. "Toward Harmonizing Command and Control with Organization and Management Theory." *The International C2 Journal* 3:1-59.
- Arrow, Kenneth J. 1985. "Informational Structure of the Firm." *The American Economic Review* 75:303-307.
- Ashby, W. Ross. 1956. "An Introduction to Cybernetics." vol. 1999. London: Chapman & Hall.
- Baldwin, Carliss Y. and Kim B. Clark. 1997. "Managing in an age of modularity." *Harvard Business Review* 75:84-93.
- Bangemann, Tom Olavi. 2005. *Shared Services in Finance and Accounting*. Aldershot: Gower.
- Beck, John C. and Michell Wade. 2006. *The Kids are Alright: How the Gamer Generation is Changing the Workplace*. Boston, Mass.: Harvard Business School Press.
- Beck, Ulrich. 1999. *World Risk Society*. Cambridge: Polity Press.
- . 2002. "The Cosmopolitan Society and its Enemies." *Theory, Culture & Society* 19:17-44.
- Beer, Michael, Russel A. Eisenstat, and Bert Spector. 1990. *The Critical Path to Corporate Renewal*. Boston, Mass.: Harvard Business School Press.
- Beniger, James R. 1986. *The control revolution: technological and economic origins of the information society*. Cambridge, Mass.: Harvard University Press.
- Bennis, Warren G., Kenneth D. Benne, and Robert Chin. 1962. "The Planning of Change: Readings in the Applied Behavioral Sciences." New York: Holt, Rinehart and Winston.
- Boisot, Max H. 1995. *Information Space: A Framework for Learning in Organizations, Institutions and Culture*. London: Routledge.
- Bower, Joseph L. 1986. *Managing the Resource Allocation Process*. Boston, Mass.: Harvard Business School Press.
- . 2000. "A General Management View of Change." in *Breaking the Code of Change*, edited by M. Beer and N. Nohria. Boston MA: Harvard Business School Press.
- . 2003. "Building the Velcro organization: Creating value through integration and maintaining organization-wide efficiency." *Ivey Business Journal* 68:1-10.
- Bower, Joseph L. and Clark G. Gilbert. 2005a. "From Resource Allocation to Strategy." Pp. xvii, 482 p. Oxford: Oxford University Press.
- . 2005b. "A Revised Model of the Resource Allocation Process." in *From Resource Allocation to Strategy*, edited by J. L. Bower and C. G. Gilbert. Oxford: Oxford University Press.
- Bradley, MICHAEL, CINDY A. Schipani, ANANT K. Sundaram, and JAMES P. Walsh. 2000. "The Purposes and Accountability of the Corporation in Contemporary Society: Corporate Governance at a Crossroads."
- Brickley, James A., Clifford W. Smith, and Jerold L. Zimmerman. 2001. *Managerial Economics and Organizational Architecture*. Boston: McGraw-Hill.
- Carnall, Colin A. 2003. *Managing Change in Organizations*. London: Prentice Hall/Financial Times.
- Chandler, Alfred D. 1962. *Strategy and Structure: Chapters in the History of American Enterprise*. Cambridge, MA: MIT Press.
- Courpasson, David and Stewart Clegg. 2006. "Dissolving the Iron Cages? Tocqueville, Michels, Bureaucracy and the Perpetuation of Elite Power." *Organization* 13:319-343.
- Dale, Ernest. 1960. *The Great Organizers*. New York: McGraw-Hill.

- . 1967. *Organization*. New York: American Management Association.
- Davenport, Thomas H. 1998. "Putting the Enterprise into the Enterprise System." *Harvard Business Review* 76:121-131.
- Davenport, Thomas H. and Jeanne G. Harris. 2007. *Competing on Analytics: The New Science of Winning*. Boston, Mass.: Harvard Business School Press.
- Doz, Y.L. and M. Kosonen. 2007. "The new deal at the top." *Harvard Business Review* 85:98-104.
- Doz, Yves L. 2005. "Resource Allocation Processes in Multidimensional Organizations: MNCs and Alliances." in *From Resource Allocation to Strategy*, edited by J. L. Bower and C. G. Gilbert. Oxford: Oxford University Press.
- Drucker, Peter F. 1988. "The Coming of the New Organization." *Harvard Business Review*.
- Durand, Jean-Pierre. 2004. *La Chaîne invisible: Travailler aujourd'hui: flux tendu et servitude volontaire*. Paris: Éditions du Seuil.
- Eisenhardt, Kathleen M. 2002. "Has Strategy Changed?" *MIT Sloan Management Review* 43:88-91.
- Fayol, Henry. 1918/1999. *Administration Industrielle et Générale*. Paris: Dunod.
- Freeland, Robert F. 2001. *The Struggle for Control of the Modern Corporation: Organizational Change at General Motors, 1924-1970*. New York: Cambridge University Press.
- Furubotn, Eirik G. and Rudolf Richter. 2000. *Institutions and Economic Theory: The Contribution of the New Institutional Economics*, Edited by T. Kuran. Ann Arbor: The University of Michigan Press.
- Goold, Michael and Andrew Campbell. 1987. *Strategies and Styles: The Role of the Centre in Managing Diversified Corporations*. Oxford: Basil Blackwell.
- Hammond, T.H. 1994. "Structure, Strategy, and the Agenda of the Firm." in *Fundamental Issues in Strategy: A Research Agenda*, edited by R. P. Rumelt, D. E. Schendel, and D. J. Teece. Boston, MA: Harvard Business School Press.
- Haslam, S. Alexander. 2004. *Psychology in Organizations: The Social Identity Approach*. London: SAGE publications.
- Hayek, Friedrich. 1945. "The Use of Knowledge in Society." *American Economic Review* XXXV:519-30.
- Himanen, Pekka. 2001. *The hacker ethic, and the spirit of the information age*. New York: Random House.
- Jensen, Michael C. 1993. *Modern Industrial Revolution, Exit, and the Failure of Internal Control Systems*: SSRN.
- . 2001a. "Corporate Budgeting Is Broken, Let's Fix It." *Harvard Business Review*.
- . 2001b. "Paying People to Lie: The Truth about the Budgeting Process." vol. 2002: Harvard Business School Working Paper 01-072; Harvard Business School Negotiations and Markets Research Paper No. 01-01.
- Jorgenson, Dale W. 2001. "Information Technology and the U.S. Economy." *The American Economic Review* 91:1-32.
- Kaplan, Robert S. and David P. Norton. 1996. *The Balanced Scorecard: Translating Strategy into Action*. Boston, Mass.: Harvard Business School Press.
- . 2004. *Strategy Maps: Converting Intangible Assets into Tangible Outcomes*. Boston, Mass: Harvard Business School Press.
- . 2008. *The execution premium: Linking strategy to operations for competitive advantage*. Boston, Mass.: Harvard Business Press.
- Lash, Scott. 2002. *Critique of information*. London ; Thousand Oaks, Calif.: SAGE.
- Lorange, Peter and Richard F. Vancil. 1977. *Strategic Planning Systems*. Englewood Cliffs, NJ: Prentice-Hall.
- March, James G. 2006. "Rationality, Foolishness, and Adaptive Intelligence." *Strategic Management Journal* 201-214.

- Merchant, Kenneth A. and Wim A. Van der Stede. 2003. *Management Control Systems: Performance Measurement, Evaluation and Incentives*. London: Prentice Hall.
- Mul, Jos de. 2005. *Cyberspace Odyssee*. Kampen: Klement.
- Parsons, Talcott. 1962. "The Problem of the Theory of Change." in *The Planning of Change*, edited by W. G. Bennis, K. D. Benne, and R. Chin. New York: Holt, Rinehart and Winston.
- Poster, Mark. 2001. "Jean Baudrillard - Selected Writings." Stanford, Cal.: Stanford University Press.
- Prahalad, C.K. 1980. "The Concept and Potential of Multidimensional Organizations." Pp. 159-176 in *Managing Managers*, edited by F. Stevens. Eindhoven: N.V. Philips' Gloeilampenfabrieken.
- Prahalad, C.K. and Venkat Ramaswamy. 2004. *The Future of Competition: Co-Creating Unique Value with Customers*. Boston, Mass.: Harvard Business School Press.
- Roberts, John. 2004. *The Modern Firm: Organizational Design for Performance and Growth*. Oxford: Oxford University Press.
- Rollinson, Derek and Aysen Broadfield. 2002. *Organisational behaviour and analysis : an integrated approach*. New York: Prentice Hall Financial Times.
- Rosen, Sherwin. 2004. *Markets and Diversity*. Cambridge, Mass.: Harvard University Press.
- Shy, Oz. 2001. *The Economics of Network Industries*. Cambridge: Cambridge University Press.
- Simon, Herbert A. 1987. "Making Management Decisions: The Role of Intuition and Emotion." *The Academy of Management Executive* 1:55-64.
- Simons, Robert. 2005. *Lever of Organization Design: How Managers Use Accountability Systems for Greater Performance And Commitment*. Boston, Mass.: Harvard Business School Press.
- Sloan, Alfred P. 1962/1986. *My Years with General Motors*. Hammondsworth: Penguin Books.
- Strikwerda, J. 2003. *Shared Service Centers: van kostenbesparing naar waardecreatie*. Assen: Van Gorcum - Stichting Management Studies.
- . 2008. *Van unitmanagement naar multidimensionale organisaties*. Assen - Den Haag: Van Gorcum - Stichting Management Studies.
- Strikwerda, J. and J. W. Stoelhorst. 2009. "The Emergence and Evolution of the Multidimensional Organization." *California Management Review* 51:11-31.
- Tapscott, Don and Anthony D. Williams. 2006. *Wikinomics : how mass collaboration changes everything*. New York: Portfolio.
- Wall, Friederike. 2006. *Informationsmanagement - Eine ökonomische Integration von Controlling und Wirtschaftsinformatik*. München: Verlag Franz Vahlen.
- Weber, Max. 1922. *Wirtschaft und Gesellschaft*. Berlin.
- Williamson, Oliver E. 1985. *The Economic Institutions of Capitalism*. New York: The Free Press.
- . 2000. "The New Institutional Economics: Taking Stock, Looking Ahead." *Journal of Economic Literature* XXXXVIII:595-613.