

Organizations and markets coevolve sharing interfaces mutually.

5.1 Evolution of Organizations

Organizations grow by stages.

In this book, the commonalities of organizations and the market,¹ in both of which the transaction is executed in compliance with the transaction interface, have been emphasized. In economics, Ronald Coase clarified in Chap. 1 of his epoch-making book *The Firm, the Market, and the Law*² that “markets are institutions that exist to facilitate exchange—that is, they exist in order to reduce the cost of carrying out exchange transactions.” This could be paraphrased, using the terminologies of this book, as “the market is a collection of interfaces to reduce transaction costs.” That is, both organizations and the market are collections of interfaces with an identical purpose.

Then what is the essential difference between organizations and the market?

The only difference is the organizational hierarchy, which functions as an interface.^{3,4} That is, the interface is determined and managed by the hierarchical

¹ “Market” means all transactions outside companies and corresponds to “society” in general terms.

² Coase, R.H.(1988), *The Firm, the Market, and the Law*, The University of Chicago Press.

³ Coase also proposed the value of organizations for the first time with the clarification of the market. In Chap. 2, “The Nature of the Firm,” of *The Firm, the Market, and the Law*, reprinted from *Economica*, n.s., 4 (1937), he focused on the economic planning function of firms and raised an objection to the absolute of market mechanisms functioning unconsciously.

⁴ Nations also have the hierarchical structure to some extent, but the structures of democratic nations are much weaker than those of companies. Although the governments of nations have some influence on the structure of the market, *market* is defined here as controlled by the market mechanism.

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structure of the organization much more flexibly and to a greater extent than they are in the market.

A hierarchy is a highly versatile interface to determine both fixed and ad hoc interfaces flexibly. That is, the hierarchy is an interface for establishing interfaces. Probably due to this reason, organizations are likely to be understood as ad hoc interface generators capable of responding to uncertainties and devaluing fixed interfaces. However, the situation has been changing rapidly these days, and more attention has been focused on the power of fixed interfaces such as modularity, standard strategy, business processes, and enterprise architectures. As a result, a line between the market, which was originally a collection of fixed interfaces, and the organization blurs. Actually, those have been coevolving through sharing fixed interfaces.

This chapter will discuss how the organization and the market with the same purposes and functions influence one another mutually, how the organization develops in the market, how the market is developed by the organization, and how both have been coevolving. The point is that both have been establishing and sharing fixed interfaces in concert with each other in order to reduce transaction costs. Four stages of the development process that both follow will be discussed as detailed in Fig. 5.1.

(1) First Stage: Emerging

This is the first of the four stages of an organization's development. A company normally originates from one or a few leaders. The leaders make all decisions, and others just follow. A fixed interface existing there (usually an implicit agreement) is that the leaders make all decisions and others follow. There is no other fixed interface, and all transactions are executed by ad hoc interfaces issued by the leaders. Individual motivation and skills are more emphasized than are institutional capabilities. "Mom and pop" stores are an illustrative example.

However, as systematic managerial methodologies have been promulgated through business schools and shared through media recently, even start-up companies are more likely to have the expertise and knowledge of the second stage from the beginning. Notwithstanding, it is still useful to analyze the basic staged structure in which companies advance by learning in a step-by-step manner.

(2) Second Stage: Centralization

In this stage, two kinds of fixed interfaces are introduced:

- Hierarchical: interfaces to determine hierarchical relationships (between managerial layers)
- Functional: interfaces to determine horizontal relationships (between departments, sections, and so forth).

Hierarchical interfaces define the managerial structure by which the roles and relations of superiorities and subordinates (e.g., directors, managers, and supervisors) are determined.

Functional interfaces define the roles of each function such as sales, production, and administration (e.g., accounting and general affairs).

		Emerging Efficient use of scarce resources	Centralization Efficient development and mgt. of resources by system	Decentralization Effective use of resources through decentralization	Unification Efficient use of decentralized resources by unification
Characteristics	Strength (early stage)	- Individual motivation - Flexibility - One charismatic decision maker	Organization/System - Scalability - Economies of scale - Standardized mgt.	Autonomy/Responsibility - Empowerment for agile and proper decision making - Individual accountability - Motivation - Competition	Total optimization - Resource sharing - Allocation of functions - Load balancing
	Weakness (late stage)	Dependency on individual - No scalability - No Economies of Scale	Limit of centralized control - Unmotivated employees - Delayed/improper decision	Limit of local optimization - Redundancy - Meaningless competition	_____
Example: Organization		- Craftsmanship - Apprenticeship	Bureaucracy (Headquarter with power)	Flat organization - Business Units - Holding company	Network organization - Horizontal division - Outsourcing - Corporate alliance
Example: IT	Hard-ware	_____	Mainframe computer	PC, WS, Super-com, Word-processor specific device	The Internet
	Mgt.	_____	Bureaucratic and standardized management by MIS department	End-user Computing	Internal: Corporate Architecture Social: Open Source

Fig. 5.1 The organization’s stages of growth

The structure is subdivided into sections, teams, and so on.
Hierarchical interfaces and *functional interfaces* are adopted in this stage without exception as follows:

(1) Hierarchical interfaces

Hierarchical structure is adopted first because it determines the roles of issuing ad hoc interfaces, which contribute most to organizations in the first stage. There are various rules and regulations explicit or implicit in organizations, but the most universal agreement between employers and employees is that employees must comply with orders of employers (or delegated superiors), if there are no fixed interfaces (or agreements a priori). The superiors always have authority to issue ad hoc interfaces. This interface distinguishes organizations from the market.⁵

As the number of subordinates is limited to the number of people whom a superior can control by issuing ad hoc interfaces, the hierarchical organization of this second stage is subdivided further downward. This is the most efficient structure as far as issuing ad hoc interfaces is concerned. Compared with organizations in the first stage, where a leader issues all ad hoc interfaces to each member, orders from a leader permeate a company through a limited number of managers. More essentially, as most decisions are made locally

⁵ In the market, obviously fixed interfaces such as regulations, rules, and contracts play significant roles, but ad hoc interfaces also exist. At the last part of every contract, a clause to designate the court to have the jurisdiction over disputes between entities is included, which delegates the third party to issue ad hoc interfaces if necessary. In countries where legal governance is immature, politicians and unofficial rulers frequently take this role.

under the authorities determined a priori, the number of transactions with a leader decreases and reduction of transaction costs are achieved (although effectiveness will decrease as well). This structure will be maintained up until the company reaches a considerable size.

If all fixed interfaces are established in the market and no ad hoc interface is required, transactions should rather be executed in the market instead of within organizations. All transactions can be executed under contracts and full-time employments, which bring some risk as fixed costs, are not needed. Because it has been impossible to execute all transactions in the market, the organization has had values. However, market contracts have recently been emphasized more and more in organizations, and entities have become more independent and modular rather than dependent and unseparated.

(2) Functional interfaces

When functional interfaces are fixed, each functional department (e.g., sales and manufacturing) has ownership as a module, which brings greater motivation and self-initiative. In addition, employees can concentrate on simplified tasks that provide plenty of opportunities to improve interfaces; efficiencies, skills, and expertise, and thus productivity are enhanced in each department. The effects of modularity can be obtained most easily with the deployment of the functional interfaces, and therefore this is the first selection for all organizations.

Those two kinds of interfaces increase in quantity and quality gradually, and the structure as a collection of interfaces advances its efficiencies and competitiveness. In a hierarchical structure, the assignment of responsibility and authority in each layer (e.g., directors, managers, and supervisors) become more explicit. The functions are usually subdivided into segments (e.g., sales group by customer segments and production lines by products),⁶ and interfaces to interconnect those segments are added and strengthened. Examples of interfaces between a sales department and a production department include communication rules, problem-reporting rules, and subsequent action rules. The communications are gradually fixed by document formats and databases. Surplus time obtained by efficiency improvements is allocated to tasks that require sophisticated, high-level capabilities such as customization, innovation, and new project planning. In the case of complicated communication such as scheduling coordination between sales and production departments that requires subtle negotiations and more than routine exchanges of formatted information, meetings are regularly held, which are also a collection of fixed and ad hoc interfaces. Efficient organizations are likely to fix procedures of

⁶ Subdivisions by product, by customer, and by region are introduced, but those are just within departments. From the third stage, the whole companies are segmented by those axes.

meetings as interfaces. In contrast, inefficient organizations and societies typically do not fix interfaces explicitly; therefore, implicit ones such as customs and informal hierarchical structures (e.g., old schools, lands of origin, and races) develop spontaneously and function practically to reduce transaction costs. Those implicit interfaces are not manageable, causing confusion and producing insufficient effects.

Fixed interfaces are added in this manner along with the organization's increase in size, volume, and complexity. However, those fixed interfaces in this second stage are still introductory; that is, they are primitive in quality and quantity, requiring complementary ad hoc interfaces that are issued by internal coordinators (i.e., superiors such as CEOs and presidents). It is not until the fourth stage where fixed interfaces function almost completely so as to embody the effects of modularity.

(3) Third Stage: Division and Decentralization

In the organization, an increase in size is accompanied by an increase in operation quality as well as quantity, which include categories of product and customer segments (e.g., demography, regions, countries, and industries). As the hierarchical organization grows in complexity, it goes beyond the limit of standardized decision-making capability, and the disadvantages of fixed interfaces such as inflexibility and slowness become apparent. At such times, responsibility and authority should be divided, delegated, and decentralized. The entities that are thus formed are named variously as strategic business units, divisionalized organizations, or company-based organizations, all of which designate division and decentralization of organizations. Although it is good enough to remain in the second stage as long as the organization has only one product in one region, the growth has a limit, generally. It is time for the organization to innovate its structure.

It is effective to divide into modules when the organization increases complexity. Each task becomes simple enough to be routinized, and fixed interfaces are easily established to reduce internal transaction costs. Axes of the division (modularization) include product, region/country, and customer segment.

In the second stage, the organization was divided by hierarchy and function. Since the concentration of redundant tasks by modularization (division and integration) improves efficiencies, new axes were added in some local departments (e.g., sales and production) individually. In this third stage, the modularization (division) is the introduction of business units, which is a corporate-wide division by one additional common axis.

With this division of the organization, a business unit system is adopted, which clarifies each responsibility as profit by separate financial statements. Power is hardly delegated without conditions; each business unit should and can have its own autonomy only when its outcomes are monitored and evaluated. Outcomes (revenues and profits) of discrete divisions by function such as sales business units and production business units are influenced by in-house transfer prices, which are often determined arbitrarily. In contrast, profits of strategic business units can be calculated readily just by utilizing the

existing accounting information. One of the most significant reasons to introduce a strategic business unit structure with a comprehensive set of all the functions is the clarification of responsibility and authority.

Overhead departments occasionally remain in headquarters and the functions are shared by all the business units so as to achieve economies of scale. There are a large number of combinations of functions from R&D, general affairs, personnel, finance, public relations, accounting, and IT that remain in headquarters. In particular, the functions of basic R&D, finance, and investor relations are likely to remain. The smaller the headquarters becomes, the more decentralized the organization becomes. And they are reaching to the fourth stage.

By establishing interfaces of accounting between headquarters and each business unit, exchanges (addition and removal) of modules with other companies—that is, trading of business units—become possible, which illustrates the advantage of modularity. Promotion of competition among business units and consequent reactivation of the organization is another advantage of such a division.

(4) Fourth Stage: Unification

The problems of the organization in the third stage are quite obvious. Parts of delegated functions to each business unit are redundant, generating considerable inefficiencies. For example, many business units outsource IT systems with the same functions individually; they develop IT systems with the same purposes but with different specifications, resulting in inability to connect and share data with each other; and their sales departments visit one customer separately and compete with each other.

In the third stage, division into modules, which realizes autonomy and independence, was prioritized to these inefficiencies. The interfaces deployed in the third stage are for *division* of each business unit. However, as each business unit grows and redundancy in their activities appears, reduction of the waste becomes recognized as a new organizational issue. A purpose of interfaces deployed in this fourth stage is interconnection of modules so as to enable the collaboration among business units that have been working discretely.

For example, new accounting interfaces are introduced to standardize accounting processing procedures across business units. New facility management interfaces are introduced for sharing the assets. New IT interfaces are introduced to integrate all data centers, all system-developing functions, and all customer data. These new challenges require each business unit to implement costly changes in business processes, which deteriorate their short-term profitability. Various objections and rejections arise.

Many companies that are adaptive enough to undertake such difficult but reasonable innovation even have replaced the integrated functions by outsourcing service providers. Obviously, more economies of scale can be obtained if a professional company integrates multiple clients' tasks than if the integration is attempted in-house. Examples include functions of data

centers, accounting, call centers, recruiting, public relations, risk management, business planning, product design, sales, and even production. This practice, business process outsourcing, is firmly entrenched in the global business community. Furthermore, outsourcing of R&D functions, which was never imagined in the past, is also gaining attention these days.

Outsourcing requires an increase in costs as much as the outsourcers' profit, but the efficiency improvement obtained makes up for the increase in cost. Companies are becoming more likely to utilize outsourcing for better resource efficiencies, especially in developed countries where equity owners require higher profitability prior to revenue.

After the spread of the Internet, which reduced global transaction costs, companies started outsourcing functions as much as possible. Then questions arise: What functions remain in-house after irrelevant functions are outsourced? What is a company per se? Actually, the utilization of outsourcing has changed the concept of a company.

Answers to those questions were already proposed in the early 1990s as key success factors of high-tech start-up companies in books such as *The Virtual Corporation*⁷ and *Regional Advantage: Culture and Competition in Silicon Valley and Route 128*.⁸ Eventually, the solutions have been embodied after the 2000s. Competition based on size has become obsolete, replaced by a newly popular, technology venture management style, in which companies outsource irrelevant functions and allocate their own resources strategically to their unique strengths. Assuming realization of further reduction of transaction costs, this is a reasonable strategy for gaining competitive advantage.

Incidentally, fixing interfaces between outsourcing service providers and clients a priori as much as possible is a key success factor for reducing transaction costs. Although the fixed interfaces between functional departments were established in the second stage, they were not perfectly designed, as there were internal coordinators such as CEOs and presidents who complement the immature fixed interfaces by issuing ad hoc interfaces. Actually, the structure heavily depended on the ad hoc interfaces. Because coordination costs between companies (outsourcers and clients) in this stage are huge, however, the fixed interfaces must be prepared for any situation and described completely as contracts.

This kind of unification is also performed by orders of superiors (e.g., CEOs) in the early third stage when the perfect independence and autonomy are not established. In contrast, the *unification* of this fourth stage is performed by consensus-based decision making.⁹ Third-stage unification is considered less

⁷ Davidow, W. and S. Malone (1992), *The Virtual Corporation*, Harper Business.

⁸ Saxenian, A. (1994), *Regional Advantage: Culture and Competition in Silicon Valley and Route 128*, First Harvard University Press.

⁹ The structure of this fourth stage can be also deemed as a derivative from the one of the third stage that has additional fixed interfaces of interconnections among business units in the third stage.

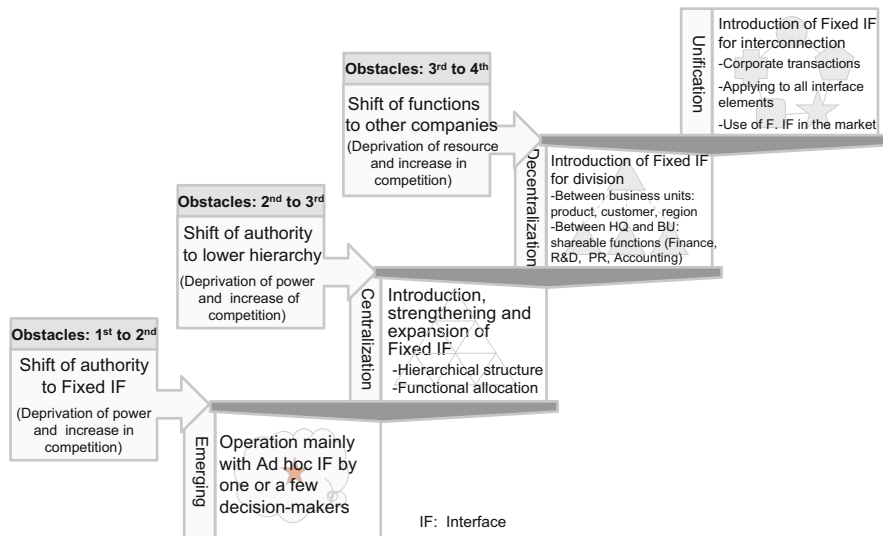


Fig. 5.2 Organizational obstacles at shifts to the higher stage: deprivation of vested rights

mature. All the organizations in the third stage should aim for *perfect independence and autonomy* to ensure further growth.

5.2 Obstacles to the Advancement to Higher Stages

The organization faces huge obstacles while they attempt to advance to the higher stages.

Although describing all the processes of the organizational growth in only a few pages may give the impression that the processes are executed without any problems, the reality is totally the inverse. The organization reaching the limits of each stage frequently cannot overcome rejections of reasonable innovations and end up with crucial decline or collapse. This subject has been explored throughout this book. The shift in and loss of vested interests destroy the significant attempts, which inevitably accompany any kind of innovation. In this section, structural difficulties in implementing corporate-wide innovations will be discussed, as diagrammed in Fig. 5.2.

- (1) Organizational obstacles characterizing the transition from the first to the second stage

There are only ad hoc interfaces in the first stage, where flexibility is required for handling uncertainties in emerging environments. However, they are not good enough to make organizations efficient. The introduction of fixed interfaces for further growth is indispensable. When fixed interfaces are introduced to replace ad hoc interfaces, the power-driven, dependent relationship between a leader and subordinates gets replaced by the agreement-driven, equal relationship. Unfortunately leaders are likely to adhere to their power (i.e., ad hoc

interfaces) because not only do they lack the capability to design fixed interfaces properly, but they also lack the ability to control their behavior. Although it may be more efficient in many cases to rely on one prominent leader's excellent capabilities, growth of organizations (complexity) and confusion of the aging leader make the problem more difficult.

During the first stage, the leader dominates the company with his/her prominent capabilities by making proper decisions, thus ensuring good results. However, he/she adheres to old customs even when the deployment of fixed interfaces is badly required, believing that he/she is an exception, being afraid of losing his/her power, and disrespecting the newly introduced rules. In this situation, the leader is destroying the change despite the fact that he/she should take a significant role as a change agent. This kind of attitude on the part of a leader constitutes a crucial obstacle to the implementation of corporate-wide changes in behaviors and styles.

Moving from the first to the second stage basically challenges the deployments of hierarchies, processes, systems, and standards—that is, fixed interfaces. The loss of authority to issue ad hoc interfaces affects not just the leader but also a group of people near the leader who have been enjoying positions of power. The same kind of objection is expected from them. A similar complaint is expressed by craftsmen whose expertise is going to be standardized and shared by their young disciples.

Arguments against the deployment of hierarchies, processes, systems, standards, and fixed interfaces typically include statements that humans will be robotized; explicitly described know-how will be leaked easily; and individual creativity will be eliminated. It is also frequently argued that subordinates are immature and yet able to delegate. However, it is quite difficult to educate them without systematic and structured simplification of tasks.

In the next chapter, which will discuss design methodologies for processes, systems, standards, organizations, and interfaces, the countermeasures against those objections will be one of the main subjects. Rejections of processes, systems, standards, and organizations that occur at the transition from the first to the second stage will be described in detail.

- (2) Organizational obstacles characterizing the transition from the second to the third stage

When the organization successfully introduces the hierarchical structure and advance to the second stage, the authority to issue ad hoc interfaces is distributed to the whole hierarchical organization, and the efficiency increases greatly. However, some issues arise at the same time. Holding the authority of ad hoc interfaces to determine output contribution and resource allocation satisfies the instinctive greed for power, which continues to grow unlimitedly.¹⁰

¹⁰ For example, governments have the authority to make decisions that are not explicitly described in laws or the authority to issue ad hoc interfaces arbitrarily. Such power grows easily and becomes a source of corruption.

In corrupt organizations where self-seeking activities are prioritized, greed for power is more significant than corporate profits. In this unhealthy circumstance, it is quite difficult to conduct even reasonable necessary innovations. Inflexibility, a disadvantage of fixed interfaces, dominates those organizations. Even though fixed interfaces become obsolete and no longer respond to the external and internal environments, the groups depending on them try to obstruct changes. Fundamentally changing such a strong existing power base requires huge organizational energies.

The obstacles inherent to the transition from the second to the third stage are explained by the negative characteristics of bureaucracy. That is, the organization grows, hierarchy as a collection of fixed interfaces becomes inflexible as described above, and the problem is likely to be neglected even though it seems objectively obvious. This issue can also be decomposed into three structural factors.

First, it is difficult to make judgments regarding to the timing of decentralization. The decentralization corresponds to delegation of powers. The delegates must have developed decision-making skills by that time. However, the judgments of the timing often differ between the delegates and the delegators. The delegates are likely to judge that they are already prepared to make decisions, while the delegators deny it. As this is a matter of effectiveness, there exists no perfectly objective judgment. The fact that the capabilities of delegates are developed through delegation leads to a hen-versus-egg type argument.

A second factor confuses the issue more. Any type of delegation deprives a group of people of benefits such as financial and human resources, privileges, and honors, which sometimes compose their lives. Therefore, objections to the deprivation of such benefits always become intense. As the power of headquarters may disappear greatly in the advancement from the second to the third stage, the objections become organizational and stronger than any expectations.

Third, there is an organizational inertia working in the reverse direction. The organization expended huge amounts of energy to concentrate powers on the bureaucrats who executed systemizations and organizations in order to complete the transition from the first to the second stage. Consequently, inertia has been created, as it was a very difficult feat. Reversion of the inertia requires more energy than the first challenge does. The inertia works against all challenges that destroy systems and organizations, even those that modify obsolete ones. Local motivations to modify problematic systems are extinguished, and unreasonable decisions due to malfunctions of organizations are ignored.

- (3) Organizational obstacles characterizing the transition from the third to the fourth stage

Redundancies among distributed business units are obvious in the third stage, but the transition from the third stage to the fourth stage precipitates organizational pains again. The purpose of this transformation is economization by eliminating the wastes, which naturally leads to the deprivation of vested rights. This causes all kinds of obstacles to the transition.

First of all, there arise objections against standardization of functions among business units (e.g., accounting, finance, personnel, general affairs, legal, IT, R&D, sales, and production). Standardization streamlines tasks and enables introduction of IT and lower-wage labors. However, it requires each business unit to change processes and forces some departments to confront the possibility of fundamental decreases in values. All kinds of objections with various expressions such as logical designation of the disadvantages and emotional supplications will occur.

For an old example, in the USA, Electronic Data Systems, which had grown explosively with the new IT outsourcing business, utilized M&As actively. It had kept merging the IT departments of its clients. Although the engineers in the clients' IT departments were treated as second-class employees at that time, they acquired incentives to expand their business as profit centers after the M&As. The company grew at an average rate of 15 % per year for 20 years until 1984, when GM merged it.¹¹ Actually the company started the intercompany unification for the first time in the world. Later, many companies followed to separate their overhead departments (e.g., IT, personnel, and general affairs), and most of them have been merged with professional service providers by now. As the key success factor of modularity is increase of task volume, intercompany unification has an obvious advantage over intracompany unification in terms of the volume. And the former has been obtaining accelerated popularity worldwide. This is a good example of a successful transition from the third to the fourth stage by converting objections into positive cooperation.

Although the spread of the strategic business unit system began in the 1920s after the successes at DuPont and GM, nearly all attempts at making this transition from the third to the fourth stage had failed for more than half a century due to the difficulties described above. The first successful unification of IT departments in DuPont, Ericsson, the EU, the US Department of Defense, and so forth triggered a trend of the transition in Western countries. In contrast, when Panasonic, which is widely known as a pioneer of the strategic business unit system in Japan, was challenged to overcome the issues of the third stage, it deployed a solution to strengthen its headquarters—that is, it reverted to the second stage. Panasonic advanced to the third stage again and repeated transitions back and forth. This is a typical structural problem for most large-sized, Japanese companies. The transformation to the fourth stage is indispensable for globalization of businesses, even for start-up companies. This illustrates Japanese companies' deviation from global managerial innovations.

¹¹ EDS became an independent company in 1996 and Hewlett-Packard Co. acquired the company in 2008. This merger of \$14 billion is the world's largest in the IT industry so far.

A commonality of all the obstacles at the three transitions is that these are accompanied by (additional) introduction of fixed interfaces. As these certainly cause elimination or drastic decrease of vested rights and intensification of competition, which also leads to decreasing the vested rights, the strong negative reactions arise. However, the need to fix interfaces increases as organizations grow. The energy for the innovations continues, accumulating like magma, and the transitions occur corporate-wide, like volcanic eruptions. Small distributed energies are not enough to overcome the objections and to provoke the changes. It is a pitched battle between all the needs for the transition and all the objections to the transition. Many companies fail to win these civil wars, resulting in decline and collapse.

5.3 Synchronized Growth of IT Systems and Organizations

The IT system grows by stages in synchronization with organizational growth.

As shown at the bottom of Fig. 5.1, the staged growth process of the organization is exactly the same as that of the IT system. The history of IT systems began with mainframe computers operated and managed by centralized structures. After undergoing the decentralization that accompanied technological advances such as minicomputers, engineering workstations, supercomputers, and PCs, the IT system experienced unification, such as sharing by internal standardization and cloud computing by the Internet. This coincides exactly with the stages of *centralization*, *decentralization*, and *unification* that the organization follows. It also has similarities regarding large-scale destruction and innovation. IBM, for example, collapsed in the transition from mainframe computers to PCs, and new venture start-up companies (e.g., Yahoo, Google, and Facebook) emerged in the transition from discrete PCs to the Internet unification.

There are two factors causing these commonalities:

(1) Technological innovations as management tools

IT systems have been developed to facilitate the processing of managerial information. Therefore, they synchronize with organizations in origin. In the centralization stage of the organization, IT systems take the same centralized structure to assist the information processing properly. In the decentralization stage of the organization, the same decentralized structure is adopted. In the unification stage of the organization, technologies for sharing information by networks and databases are developed. However, it could be more plausible to argue that IT developers proposed the new structures of information processing after their contemplation and practice of ideal management and organizations. Not incidentally, outsourcings and network organizations were born and brought up in Silicon Valley in the USA and spread worldwide. As IT is the area with the biggest innovations, Silicon Valley attracts highly innovative people who enjoy creation and self-growth from all over the world. The management technologies of Google, Oracle, Sun Microsystems, HP, Microsoft, and IBM have obtained attention by necessity.

(2) Efficiencies in utilization of scarce resources

The scarcest resource in an organization is managers who make decisions and manage executions. The structures to maximize the efficiencies of CEO/presidents in the first stage and bureaucrats in the second stage are adopted. When those resources become abundant, those are distributed to the locales in the third stage and are allocated for managing total optimization in the fourth stage. Similarly, in IT systems, the centralized structure is first adopted in order to utilize the scarce resources such as CPUs, memories, and input/output devices efficiently. As the prices of those resources decrease, those are distributed to be used locally. Finally, in the fourth stage, those resources are also allocated to functions of networking and sharing resources.

5.4 Growth of the Market (Society)

The organization and the market coevolve sharing interfaces.

As described above, the organization's growth process proceeds with establishing fixed interfaces. In this section, the structure and process by which those fixed interfaces in the organization become shared in the market (society) to become assets of the society and another structure and process by which the organization deploys fixed interfaces existing in the market will be discussed. The organization and the market coevolve through the four stages synchronously.

(1) Organizational interfaces of the second stage shared in the market

It is impossible to share interfaces of the first stage, as there is no fixed interface at the stage (except the one that determines the authority of a leader). However, the interfaces of the hierarchy and the functional allocation in the second stage are shared in the market widely. The roles of managerial positions (e.g., directors and managers) and departments (e.g., sales, production, personnel, and accounting) are quite identical among companies worldwide. Only marketing departments vary in their roles according to industries, as marketing functions such as planning, development, and promotion of products differ by product (e.g., consumer goods/industrial goods and contract-based/self-development) and by customer segment (e.g., supply-oriented emerging/demand-oriented mature market). There are commonalities because the interfaces are reasonable enough to have been adopted and shared by all companies through their business interactions over many years.

These standardized interfaces regarding managerial positions and departments have defined occupational qualifications and established labor markets where transactions of managers are executed. For example, sales managers are able to change companies, and accounting personnel are even able to change countries due to International Financial Reporting Standards (IFRS).

As occupational qualification systems guarantee capabilities of individual professionals by standardized evaluation systems, transactions with the licensees are fairly easy. For example, as the light frame construction industry

in North America and Australia standardized its building materials and skills, carpenters are readily substituted.

(2) Organizational interfaces of the third stage shared in the market

Accounting is adopted to clarify the responsibility of each strategic business unit. Quasi-companies are formed within a company and evaluated by financial statements (i.e., profit-and-loss statements and balance sheets), like listed companies in stock markets. Responding to fierce competition, their profitability is monitored and evaluated severely.

Financial accounting was developed for information provision and quality assurance of products—in this case, companies (ownerships of companies) that are traded in stock markets. As investment activities become global, IFRS are standardized internationally. The establishment of those fixed interfaces promotes transactions of business units and companies. Investment activities in developing countries where the quality assurance systems are not yet credible are still risky.

(3) Organizational interfaces of the fourth stage shared in the market

In the fourth stage, redundant functions are unified both intra- and inter-company. As for intracompany unification, tasks such as IT, general affairs, personnel, finance, and accounting are standardized and integrated across business units to improve efficiencies. As for intercompany, those services are provided by professional firms that offer fixed specifications and transaction conditions to multiple clients.

Integrated information system packages are available these days to assist those outsource service providers, which are also standardized in the market. As a consequence of competition for the standardization among IT vendors, fixed interfaces have been established in the market. The standardizations are progressing with systems such as SCM, sales force automation (SFA), CRM, personnel management systems, accounting systems, ERPs, which integrate the systems above, PDM, and call center management systems. In addition, ISO9000 for quality assurance, PMBOK,¹² and CMMI or COBIT have also standardized the interfaces in the market.

It is important to note here that the interfaces by which not whole ownership but only use rights are transacted have been established for the outsourcing. Although ownerships should have been transacted to use external resources until the fourth stage,¹³ companies in the fourth stage have established interfaces to transact only use rights of external resources, such as computers, networks, databases, cloud computing, and production facilities. For better readiness and efficiencies, interfaces for transacting those resources are being standardized as well.

¹² Project Management Body of Knowledge, which is the guide for project management proposed by the Project Management Institute for project management.

¹³ Except for rental and leasing.

5.5 Coevolutions of Markets, Societies, Organizations, and Individuals

The establishment of fixed interfaces vitalizes the organization and the market and alters ways of developing individual capabilities.

As described in the previous chapter, interfaces in the organization become shared in the market; that is, they are standardized as assets of the society. It also means that interfaces in the market become deployed by the organization. The organization and the market have been advancing the stages synchronously, and the synchronization appears to be getting stronger.

Challenges to reducing transaction costs appear in the organization as well as in the market and the society. This implies that it is not correct to recognize only organizations reduce transaction costs. Human beings have always sought opportunities to reduce transaction costs, and technologies have been evolving everywhere in organizations and in markets. Because markets originated as platforms for transactions, they constitute nexuses of interfaces. As the society is considered to be a platform for relations (transactions) of people, the society is considered to be a nexus of interfaces. In addition to the reduction of transaction costs, fixed interfaces clarify people's rights (ownership and human rights). Because it matches with humanitarianism and justice, fixing interfaces has also been pursued throughout human history.

Interfaces in the organization are shared in the market and vice versa. While fixing and standardizing interfaces have always been pursued, the organization and the market are mutually utilizing and sharing interfaces consciously and unconsciously. It is interesting to notice that organizational interfaces are not a target of competitions and shared in the society peacefully despite companies competing fiercely for acquiring standards of product interfaces (specifications).

For example, recommendation reports from management consulting firms are usually properties of the consulting firms and repetitively reused for other clients. Therefore, there are some consulting firms that differentiate themselves by stating that they have only one client in one industry. Although a reuse of a recommendation for strategies seldom occurs, as it violates their professional ethics, recommendations regarding organizational structures are regularly reused. The strategic business unit system obtained its popularity under such circumstances. Information systems integrators usually assert property rights of custom-made systems for repetitive reuses, and in return they provide their first client a special discount. Contracts, descriptions of transaction interfaces, are also reused without any notice by law firms who created them or by clients who ordered them either legally or illegally. These facts, interestingly, show that fixed interfaces of organizations that have been analyzed as significant assets for competition throughout this book have not been acknowledged by companies at all.

Even proprietary interfaces of product specifications become standardized eventually. Commoditization means a shift of ownership of a product specification from private to public by sharing and standardizing the interface. The property is

protected by a patent at first, but the specification is spread to the public in various manners. All transacted resources, including software, technologies, engineers, managers, and companies, are commoditized eventually by standardization of specifications. Although the speed of commoditization varies according to the complexity and specificity of resources, it accelerates more and more in general. Establishment of interfaces for information sharing in the society promotes the spread of interfaces, which also facilitates development of personal capabilities to design and utilize interfaces. Those are in a synergistic relationship.

The more transaction interfaces that are established, the easier transactions become. Robot programs that automatically search, extract, and deliver information that users requested will possibly obtain popularity when a few more interfaces are established. Those will begin soon to negotiate, agree, and conclude contracts with each other. A new age of transactions will dawn soon in which social transactions are different from those of today. Capabilities required for each individual at that time must be quite different as well.