

RESOURCE USE IN DIFFERENT ECONOMIC SYSTEM
A network approach

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Introduction

One of the classical assumptions in economics is that resources are homogenous to their character and that they are given. Several scholars in marketing (Alderson, 1965) and management (Penrose, 1959; Barney, 1986) have discussed and criticized this assumption. Also economists like Alchian and Demsetz (1972) and Williamson (1975, 1985) have approached the resource concept from a different angle than departing from the idea that resources are perfect homogeneous. Maybe the first proponent of a more sophisticated definition of resources was Hayek (1936; 1945), who tackled this topic by discussing how knowledge was created, used and diffused in different economic systems. His target was the Soviet planned economy, which at that time was only in its cradle, having been launched in the end of the 1920s by Stalin.

Following the idea that resources are heterogeneous to their nature, I analyse in this paper analyse how resources are used within and between firms in different economic systems. Two theoretical schools have more than others made resource heterogeneity to their point of departure and this is the resource-based theory of the firm and the network perspective. Both these emphasize the dynamics of resource use and I focus here on two activities, planning of the use and the combining of resources, and on how knowledge is created and used for these purposes.

The paper is organised in the following way. I start by given a background through a description of the institutional environment in a planned economy, which is followed by a discussion of the resource concept in accordance with the resource-based theory and the network perspective. The method section presents the research setting, the data collection and how the key concepts were observed. After that, the paper put the light on the resource use in the planned economy, which is also the first empirical part of the paper. The first section introduces the focal product and after that, the paper reports how the resource use in the planned economy was done. The institutional changes important for the resource use, which took place during the first half of the 1990s, are after that presented. The next section discusses resource use in the transition economy. Before the final discussion, the case is analyzed in terms of resource uses in different economic systems.

The institutional environment in the planned economy*

The institutional framework regulating the resource use was centrally fixed prices and costs, qualities and standards, a taut and centralized planning covering almost the whole economy and separation of change and development of technology, on the one hand, and implementation and deployment of the new technology, on the other hand. Prices were the Soviet economy mainly used as control mechanisms. They were stable and fixed by GOSKOMTSEN and the firms could not affect them. Prices did only play a passive role in the economy and existed mainly for accounting, control and measurement purposes. Prices on products were set on cost-plus basis and included profits, turnover taxes and handling charges. They were aimed to cover average costs in each branch of the economy. The intention was that each firm should be self-financed. Standards and qualities on products were regulated through the use of GOST, which was a governmental standard. There were no incentives to produce products of a higher quality level than stated in GOST, because the price was regulated and an increase in quality would just induce higher costs. Furthermore, if the firm manufactured products of higher quality, this would not affect the wellbeing for the firm. On the other hand, the buyer could reject products not meeting the standards set by GOST. Rejections were deducted from the firm's production and could lead to failure by the buyer to fulfil its plan. Despite GOST, the firms often had to give priority to the production of quantity at the expense of quality.

A number of governmental organizations existed in parallel to firms. Their task was to plan the use of the resource in the economy. Over 20 State committees and other agencies with ministerial status answered for some specific aspect of the economy. For instance, GOSPLAN had the task of developing a general plan and the methods and means to implement it while GOSSNAB was responsible for the physical distribution of products and controlled the fulfillment of the plans. GOSPLAN did the planning all the way down to the production level, but it was the ministries that had the actual executive power and made the plans for each firm concrete. The ministries had extensive power regarding the distribution of resources and the possibility to exert one's influence over this was limited. Change was linear in the planned economy. Planning, searching and finding new technologies were the authorities' task and using them the firms' task. Thus, research was usually isolated from practise. The formal research and development were performed by the Academy of

* The following section is based on Berliner (1976), Ericson (1991) and Nove (1984).

Science, the ministries or state committees and was remote from problems the firms experienced and, most important, from the economic consequences of the new technology. New technology was based on the conviction that: "central planners know what needs to be done" and the innovation process on the idea that perfect knowledge existed and that those who planned change also perfectly knew how the new technology should be used and the consequences of doing this. The main innovative function of the firm was to implement the innovations commanded from the authorities. This also meant that both the user and the supplier were resistant to new technologies as the user's needs were not incorporated into design and often the new technology did not fit his needs.

Resource heterogeneity and two theories

The branch within the strategic management literature called the resource-based view of the firm, focus on internal processes and competences as a source of competitive advantage (i.e. Barney 1991, Grant 1991). Resource-based theory initially evolved to offer an alternative explanation of the long-term differences in firm profitability that cannot be attributed to variability in industry conditions (Peteraf, 1993). Within this research tradition, sustainable competitive advantage is basically a function of internally developing and controlling unique combination of resources. The strength of a resource combination has its roots in the fact that resources are difficult to imitate (Dierickx & Cool, 1989; Amit & Schoemaker, 1993; Peteraf, 1993; Barney, 1991), replicate (Dierickx & Cool, 1989; Grant, 1991), substitute (Dierickx & Cool 1989; Peteraf 1993), and transfer (Grant, 1991) without losing value. The firm is, according to this tradition, specialized in using its resources to the extent that holding its resources within the firm is perceived as more efficient than combining them through market interaction (Peteraf, 1993). Thus, use of resources takes place within the boundaries of the firm and from that follows that the use of resources explains the profitability and competitive advantage of the firm. Any kind of positive result, like growth, profit, increased market share, etc, that is externally produced is rather seen as a result of luck (Barney, 1986) or serendipity (Denrell, Fang & Winter, 2003).

Researchers from the IMP-tradition emphasise the importance of long-term relationships that are embedded in an industrial network (Håkansson & Snehota 1995). Relationships are connected to each other in a structure, a network (Anderson, Håkansson and Johanson, 1994), Axelsson & Easton, 1992; Håkansson & Snehota, 1995). This means that a relationship is affected by a larger exchange network, but is also affecting the same network (Håkansson & Snehota 1995). The resources that actors use to perform its activities have interfaces to other resources, and the use of a resource at one place of a network will therefore also affect the use of another resource, controlled by an actor in a different part of a network. Combining heterogeneous resources implies that the value depends on what resources are combined together. Resource heterogeneity is the point of departure in the IMP tradition (Hägg and Johanson, 1982). Consequently, this research tradition views resource use as a network phenomenon, where several actors, beyond the dyadic relationship are involved in the process (Blankenburg-Holm, Eriksson and Johanson, 1999). Accordingly use of resources is important sequences in the production process in industrial network. Moreover, in the process, not only the buyer and seller are active, but also firms with which the buyer and seller are indirectly connected to.

	Resource-based theory	Network perspective
Unit of analysis	Firm	Set of connected firms and relationships
Theoretical ambition	Normative	Descriptive
The role of the focal firm	It internally develops combination of resources	It both sells and buys, but is also active in technology development with other firms
The role of other firms	Customers and supplies are absent; competitors' profitability is implicitly interesting	Firms are locked-in in a set of relationships with other firms, which can be customers, suppliers and competitors
Key assumption	Resource heterogeneity within the firm	Resource heterogeneity
Source of competitiveness	Development and exploitation of capabilities	Position in the network
Temporal orientation	Essentially dynamic; learning and capability building as structure developmental processes	Interplay between dynamics and structure
View on Value	Focus on where and how value	Both creation and realisation are activities

is created (within the firm) and in the value production process and both
 less focus on how value is buyer and supplier are active as well as
 realised other firms

Table 1. A review of the resource-based view and the IMP perspective.

The resource-based view and the network perspective base their reasoning on the assumption that resources are heterogeneous, with a common reference in Penrose’s (1959) seminal work. An important difference between the perspectives is that they have different unit of analysis, the network school taking the dyadic exchange relationship and the network of connected firms and relationships as the unit of analysis, while the resource-based view have the single firm as its focus. This has certainly implications for how firm’s performance is approached and understood. With a firm perspective, as in the resource-based view, performance stems from the resources deployed and controlled internally. With a network perspective, the resources combined and used in the dyadic relationship as well as the use of resources in relation to connected relationships in the network are of interest.

Method section

The setting

The setting for this analysis is a printing house, Tipografiya, and its customers and suppliers. Tipografiya is an old firm, which existed already before the Russian revolution. It is located to the City of Novgorod and formally its owner was the regional district administration, which was the reason why the most important products produced until the beginning of the 1990s were forms and the local newspapers. Forms constituted the most important product Tipografiya produced and sold from the middle of the 1980s until 2000. The vast majority of the forms Tipografiya printed were for the regional branches of the Soviet Post Office Administration. The forms were standardised in terms of quality of the paper, size, and layout and did not change over the years. Approximately 60 different types of forms existed for the Post Office and Tipografiya used to print ten types of forms, while other printing houses printed the remainder.

Data collection

The data collection combined two temporal approaches (Leonard-Barton, 1990). While the period 1987–1996 was studied in retrospect, the data collection for the period 1996–2000 was conducted in real time. Three ways of collecting data were used in this study: Direct observation, documentary sources and interviews (Table 2). I followed the work at the printing house and spent altogether five weeks at the firm. I had complete freedom to follow the work, to study the building and the equipment, and to have short conversations with the employees. The direct observation confirmed and strengthened many of the observations made through interviews. Documentary sources were used for the period 1993–2000, owing to the fact that all older documents had been destroyed in the middle of the 1990s when the management thought they were obsolete and of no use. Altogether 35 interviews were conducted. The interviews were conducted by the author in Russian and tape-recorded. The interviews were arranged between September 1996 and June 2000 and took between 30 minutes and 2 hours.

	1987-1993	1994-1996	1996-2000
Interviews	35 interviews were made with 11 employees each of them being directly or indirectly involved in the production of forms for the Post Offices. The interviews covered the whole period studied.		
Documentary sources		Annual reports, statistics and other types of internal documents not older than from 1994 were used.	
Direct observation			Direct observation of the production process was made re-currently in real time from September 1996 to June 2000.

Table 2 Summary of the data collection

Retrospect

Real time

Observing the key concepts

Production of forms is usually a standardised activity and the result is a standardised product. The quality of the product is stable and predictable and the production should be repetitive. Resources in terms of paper and inks do usually not change quickly and the machine and equipment deployed are also the same. Consequently, the focal product is form and the concepts of knowledge use, planning of use and resource combining have been observed by studying the production of form at Tipografiya. The resources in focus were the machines and equipment, the physical facilities at Tipografiya, the raw material and the component used in the production process and finally the gradually transformed product, which in the end could be called form.

Case part I – resource use in the planned economy

The vast majority of the forms Tipografiya printed were for the regional branches of the Soviet Post Office Administration. The forms were standardised in terms of quality of the paper, size, and layout and did not change over the years. As the production was standardised, Tipografiya did not have to do that often. Production started when one employee at the plan and production department gave the production specification to the printing shops and was also responsible for that the production took place according to timetable. After production, the accounting department wrote a pass and gave it to the store for finished products. Tipografiya was not involved in the physical distribution.

Before the forms were printed, the composition room prepared the matrices, which were used in production of forms. Composition preceded the printing and was done by production of printing blocks in lead. This was done manually. The composition room was a large and demanding part of Tipografiya and it was the most intensive and lively department at Tipografiya. It worked in two shifts. In parallel to the composition the right quality and quantity of the paper that was going to be used in production was prepared. Paper was stored in a special stockroom, where one employee worked. She reported to the accounting department and she made the calculation and estimation of the paper used in production. She also took the paper to the printing shop.

The forms were printed almost exclusively on the relief printing presses as they were usually standardised and did not require any adaptations, but sometimes, in the end of the 1980s, on the offset machines. The relief printing shop was situated partly on the first floor, but there was also a room with a few printing presses on the ground floor. Altogether, Tipografiya had eight relief printing presses, which had been supplied before 1986.

After the forms were printed, they were cut in the bookbindery and taken to the stock room for finished products. It consisted of paper cutters without computer programming and equipment for bookbindery. The equipment was exclusively from a producer in the Ukraine. The forms were then taken to the stock of finished products, which was located to the first floor. One employee managed the stock of finished products.

In order to print the forms Tipografiya was supplied with paper, inks and material needed for composition. Writing paper was the standard used for production of forms and it was mainly either *DAO Bumaga Arkhangelsk* or *SyktvyvkarSKIY TBK*, which supplied the writing paper. The most traditional supplier of inks was *TorzhorSKIY Zavod Krasok*, located in the neighbouring district of Kalinin (which in the 1990s changed its name back to Tver). *Poligrafresursy* had supplied matrices and *LeningradSKIY Shriftoliteyny Zavod* lead over a long period.

Resource use in the production process in the planned economy

Tipografiya printed forms for the Soviet Post Administration over the whole period. *Lensvyazsnabkomplektatsiya* (LSSK) was the organization for all the regional branches of the Post Office Administration in the Soviet Union and the allocation of forms was governed by LSSK. The forms were annually depicted in the Ministry of Transport and Communication's catalogue. The regional branches specified the volumes of each type of form for the coming year and sent it to LSSK. Tipografiya was, at the beginning of the year, allocated production plans by LSSK, which specified products and quantities that were planned to be produced. The plan also included prices and salaries. It was the plan and production department, which received the plan from LSSK. They had also most no direct contacts with the customers and they never paid them a visit. After the plan order was received, a note of production was taken to the paper store where the paper was prepared and brought to composition room. The order receiver also gave the specification to the printing shop. In parallel, the accounting department received the money, controlled the payments, and wrote a pass that was given to the store for finished products.

Putting products in production

Printing forms can be viewed as a process of sequences where resources were used different combinations. It was LSSK, which provided paper. It sent plan orders to the paper and pulp kombinats, which specified the quality and quantity of paper supposed to be supplied to Tipografiya. There was a constant shortage of paper; Tipografiya had to be satisfied if they had a sufficient quantity of paper. This meant that it preferred to receive as large quantities as possible and to keep them in stock for long periods. It fell on the paper and pulp kombinats to secure the transport of the paper. Train usually did this and Tipografiya received the paper a couple of days after the supplier had called Tipografiya and informed that the paper was on its way. Tipografiya paid LSSK and not the supplier for the paper immediately the paper had been delivered. The paper was put in the stockroom for paper and kept there until it was time to start production. Tipografiya had to produce the decided quantity, but could this when it was convenient, but by the quarter allocated over the year.

Paper was the most important product for Tipografiya. A critical moment in the production of forms was between the deliveries of the paper, its quality, volumes supplied and physical facilities at Tipografiya. The suppliers produced paper in lines with the governmental standard. They handled the transportation, which usually was made by train, and Tipografiya received the paper a couple of days after notice of delivery. Tipografiya could not influence the time of delivery. The paper quality was decided by LSSK and produced by a paper and pulp kombinates, but used in production by Tipografiya and subsequently used in the post offices all over the Soviet Union. The latter two had no possibilities to influence the quality of the paper. The volumes supplied was also decided by LSSK, but as there was a constant shortage and Tipografiya did not pay for the paper, it preferred to have as big stock of paper as possible. The paper and pulp kombinates just tried to supply according to plan orders from LSSK; neither LSSK, the paper and pulp kombinates nor the post offices had any knowledge about the stockroom for paper at Tipografiya. Tipografiya could not influence quality, quantity, transportation, or supplier, but the employees had over times learned identify the differences in quality between the paper from the various suppliers, and how to use them in production.

Altogether this often resulted in situations where there were either too big volumes of paper in stock at Tipografiya or too little in stock. Having too little meant that Tipografiya could not start production when it was time, while having too much paper, which was viewed as strength by Tipografiya, meant that the paper was piled in a room where the temperature and humidity could not be regulated. When taken to the relief printing shop for production the paper was therefore usually yellow, instead of white, and wavy, which firstly affected how inks, stereotypes and printing press were combined and secondly affected the relationships between Tipografiya and the post offices.

The organization of the composition was very much the same to organization of paper. When Tipografiya needed material for composition, it had to turn to KPI (Komitet po pechat i informatsii), which was a committee at Oblispolkom (the District Administration), which had responsibility and dealt with issues related to the printing industry and mass media. KPI made centralised inquiries and was completely responsible for the supply of consumables such as inks, and stereotypes, but the goods were delivered direct from the producers. Tipografiya often had to wait, usually for a long time even though they had already sent the money. KPI actually had a small stock of various consumables, for instance, it received inks and Tipografiya collected ink from this stock. However, the common was that KPI:s inquiries were sent to Moscow, turned into production orders, and distributed to the producers. Although there was a shortage of these consumables as well, they were not so vulnerable as paper. They could easily be kept in stock for quite a long time without loosing in quality. The consumables used in the composition were kept in stock right in the composition room.

A critical resource both for composition and printing was the employees involved in the production. It was not unusual that there was a shortage of staff, which partly influenced the quality of the forms printed and partly meant that Tipografiya sometimes had difficulties in producing on time. It even happened that Tipografiya invited typesetters from other printing houses.

Combining the supplies just discussed, inks, matrices and paper, and machines and equipment like printing presses together with human resources made printing forms. Oblispolkom (the District Administration) was the formal owner of Tipografiya. The only role Oblispolkom played, as owner, was when it allocated resources for investment. These decisions were tied to political priorities or centralised decisions made in Moscow. However, it was KPI, which financed the investment in new equipment like, for instance, printing machines. Tipografiya had no possibility of saving any money for investments in the future, since all profit was transferred to the government as taxes.

Deliveries were made in trains and containers in the same way. Tipografiya concluded agreements with the railway. At the beginning of each month, Tipografiya gave the railway information about volumes and destinations and the railway required Tipografiya to fulfil the timetable. After that, the containers were sent away and the plan and production department wrote the invoice and sent it by mail. The regional branches

paid immediately when they received the invoice and they were almost never late with the payment. No one at Tipografiya knew what happened to the forms after they had left the stockroom for finished products. However, the Post Office Administration did not have any complaints about Tipografiya.

In the price for the forms, only expenses in terms of physical work carried out by Tipografiya were included; thus expenses for inks and paper, bought by Tipografiya, were not included. The Post Office Administration paid LSSK for them. Tipografiya was paid when the products were produced not when they were delivered, and no credit was given.

Institutional changes and resource use

When the dismantling of the Soviet economic planning system began around 1990, Tipografiya was facing a period of transition. Four main changes in the economic planning system occurred: Change of corporate governance, change to market governance, abolition of entry barriers and liberalisation of foreign trade.

Change of corporate governance

In 1992 Russia began a big scale privatisation of almost the whole economy, but already, before this, in 1991, Tipografiya had been transformed into a leasing company. Two years later, in 1993, Tipografiya became a joint stock company and the employees acquired the stocks from the state, which meant that the District Administration through KPI no longer controlled and owned Tipografiya. In parallel, the majority of Tipografiya's customers and suppliers were also privatized.

Change to market governance

In parallel with the change of corporate governance, economic plans and planning authorities were dismantled and the prices liberalised. In Tipografiya's case, this meant that LSSK and KPI gradually played a less critical role for how forms were produced. Initially LSSK served as an intermediary, Tipografiya then had to pay LSSK for its services, but, in 1994, Tipografiya perceived that LSSK's importance for the relationship was negligible and it terminated the contacts with LSSK and started to do business directly with the regional branches of the Post Office Administration. This made it possible to reassess the exchange partners, which resulted in a widespread dissolution of business relationships. During the transition period, the relationships with the regional branches changed both in terms of volumes sold and the character of the relationships.

Abolition of entry barriers

The abolition of entry barriers meant that more firms appeared in the market and a more complex structure with greater competition evolved. This was also the case for Tipografiya. Several new suppliers of, for instance, paper, entered the market, while, at least, one printing shop appeared in Novgorod. Also in other regions, printing shops appeared. For instance, *Polex* from Nizhny Novgorod was a trading company, appeared in the middle of the 1990s and attracted a number of Tipografiya's old customers.

Liberalisation of foreign trade

The liberalization of foreign trade started already in 1987 when foreign firms were permitted to enter the market by forming joint ventures with Soviet firms. At the same time almost 100 Soviet organizations were allowed to export and import. Something, which until then, had been completely controlled by the Ministry of foreign trade. The liberalization continued thereafter, when foreign firms could begin to found their own joint stock company. The 1990s also meant that Russian firms with some exception could begin to export and import. In Tipografiya's case this resulted in new products like, for instance, ink entered the market. New foreign suppliers of equipment and products became active in Russia around 1995.

Case part II - resource use in the transition economy

In 1995 Tipografiya still concluded agreements with 30 out of 75 regional branches. The forms were still depicted annually in the Ministry of Transport and Communication's catalogue and no one could influence their design. The layout of the forms had not changed since 1992, but during 1997–98 there were some small changes: the logotype and the organisation name were replaced. However, at Tipografiya, the production of forms was still regarded as simple and standardized from a technical point of view, even though the forms were the most profitable products. After LSSK had disappeared, Tipografiya negotiated a contract with all branches once a year. Tipografiya distributed a standardised contract, where the price was stipulated, to the regional branches. If they intended using Tipografiya as a supplier for the following year, they specified, signed, and returned the contract.

In 1996 the plan and production department, but now called, production and finance department, was still in charge of reception of orders, preparation of price lists, control of production times, invoicing, and

follow-up of price calculation. However, in 1997 Tipografiya re-organised the activities related to production of forms to the regional branches of the Post Office Administration. The responsibility of all the regional branches was moved to the newly founded business centre, which worked out the orders and gave them to the composition room and the printing shops. It also monitored the production and registered incoming and outgoing orders, prepared invoices and received the payments. The business centre was located on the ground floor and had its entrance from the street.

Putting products in production in the transition economy

The fact that LSSK from 1994 did not govern the relationships with the regional branches of the Post Office Administration meant that Tipografiya and the Post Administration's offices were given the freedom to decide how to coordinate the production of forms. Writing paper quality was still used, but around 1995 Tipografiya began to print the forms on a cheaper, lower quality type of writing paper. This measure was aimed at lowering the price, which was welcomed by the customers. Paper remained the most important product bought, as the costs of paper were approximately 75 % of the current assets. Moreover, the quality of the paper determined to a great extent the quality of the forms. Earlier all the kombinats produced in accordance with governmental standards, but most of them abandoned the standards during the 1990s. However, when Tipografiya began to buy writing paper, quality was not an explicit part of the strategy, but it became more and more important. Instead, Tipografiya paid a lot of attention to price as it preferred to find the cheapest paper available in the market and to buy big volumes, which resulted in the same situation as during the planned economy, but for new reasons; a big constant stock and that much of the forms were printed on wavy and yellow paper. Moreover, a big stock was still viewed as strength, especially when the paper was found for a low price. The paper was still stored in the stockroom for paper and kept there until it was taken to the printing shop.

Despite decreasing production volumes, Tipografiya still bought wagons of paper and used the railways for the deliveries. In the beginning of the period, Tipografiya continued to buy from the same kombinats, which had already been supplying it in the planned economy, but in the middle of the 1990s a change began, when several intermediaries entered the market. They offered lower prices than the producers of writing papers and Tipografiya began to buy from them instead of buying directly from the producers. In 1996, the intermediaries had taken over almost everything from the paper and pulp kombinats. Tipografiya bought writing paper from *Nevskaya Bumaga*. Nevskaya Bumaga was able to cut the costs and consequently the price. An additional big advantage was that Nevskaya Bumaga did not require prepayment. But, although Tipografiya could now decide qualities and quantities it still meant the same producers of the writing paper and the same qualities.

When volumes of produced forms decreased, Tipografiya moved the production from the relief printing shop to the offset equipment, although small orders were sometimes relief printed. The first offset machine had been delivered already in 1977, but it had been used solely for production of other products. When the institutional changes began, Tipografiya had eight offset machines. The reason why the production was moved to the offset machines was partly higher quality, but mainly, due to the fact that the small batches made it more beneficiary to print the forms on the offset presses than relief presses. Printing on the offset presses also meant that the composition was now made on computers. The first computers had appeared already in the end of the planned economy the first computers appeared. Tipografiya bought three computers in 1991 and in 1995-1996, Tipografiya bought seven new computers.

The forms were still cut in the bookbindery by the same equipment and taken to the room for finished products. Tipografiya took care of the transportation of the forms. Containers sent by train were used to make the deliveries in the same way as during the planned economy, and on some occasions deliveries were made in packages sent by mail. In one case, the relationship with the Leningrad district a driver regularly picked up the forms. After 1992, the deliveries began to take place once a month, but in 1996 Tipografiya took over the responsibility for the transportation and used its newly bought van.

Besides paper, inks continued to be the biggest products in terms of volume. Inks were stored right in the printing shops. Tipografiya bought all the inks for the relief printing from *Torzhorskiy Zavod Krasok*. A few times a year, inks were collected by Tipografiya's own van. The quantities of inks purchased from this supplier decreased during the period from 1993 to 1998, due to the decrease in production, but also because Tipografiya printed much more on the offset machines, which required inks produced abroad. The suppliers were Heidelberg or Ipris in St. Petersburg. Tipografiya continued to buy matrices from *Poligrafresursy* and sometimes from *Shadrinskiy Zavod Poligraficheskikh Mashin* in Kurgan. But since Tipografiya step-by-step began to print more and more of the forms at offset presses offset plates were needed. Tipografiya bought them from *Ipris*. Poligrafresursy had supplied all plates for a long period, but around 1995 was replaced by Ipris.

When the relationship with LSSK was terminated and the relationship with KPI just was dissolved, the managing director took over the responsibility for the purchasing of paper and owing to the financial crisis in Russia his only goal was to buy the paper as cheap as possible and did not let the production staff interfere in the choice of paper suppliers. Although less important for the finances, the chief engineer was in charge of the purchasing of consumables, neither did he listen to what the setter or printers had to tell about the qualities of the consumables.

Case analysis - Resource use in different economic systems

Planning and combining resources

Planning the use of resources and combining the resources are activities that are necessary for production of forms. They can be integrated but also separated. If they are integrated, planning tend to be performed close, both in time and space, to the physical combining of resource, but they can also be separated, which tended to be the case in the planned economy. The case shows that the resource interaction in the was done by a combination of authority planning performed by KPI and LSSK, planning that was performed by the plan and production department at Tipografiya and combining of resources like the products and facilities in five administrative units at Tipografiya. These efforts were usually separated and took place distant from each other and these efforts were not matched with each other. Critical both for the planning and the resource combining was the knowledge of the actor, who performed the activity. The authority planning was in the case done by two plan authorities, and their plan orders were transformed into production orders by the plan and production department at Tipografiya and given to the composition room and stockroom for papers and Tipografiya. Based on this two initial observations can be made.

Firstly, this meant that the authorities governed the planning performed by the plan and production department at Tipografiya, but also that LSSK and KPI governed the resource combining between the five administrative units involved in the production of forms. This was especially the case in the relationships between the administrative units at Tipografiya and its customers and suppliers. However the authorities did not govern the relationship between the administrative units, like, for instance, between the relief printing shop and the bookbindery. This is not to say that the relationships between the administrative units were completely beyond the governance from the authorities. Some of them, for instance, the composition room and the stockroom for paper were influenced by the plans from authorities, but they were not directly governed by authority planning.

Secondly, the authority planning resulted in a situation where Tipografiya did not influence the planning done by the authorities, which meant that the knowledge that was developed through combining of the resources was only used internally at Tipografiya and did not influence the plans from the authorities. Some of this knowledge was used by the plan and production department at Tipografiya, but none of that knowledge was given back to LSSK and KPI. An example of this was the relief printing shop, which printed forms, which only had to be cut before they could be delivered to the customer. In the relief printing shop equipment (printing presses), human resources (printers) and the physical facilities on the first or second floor were deployed. Within the frame of the plan the relief printing shop could choose to print whenever it was convenient. Moreover, it had possibility to develop new methods and new ways of combining the existing resources, but the knowledge the relief printing ship developed was seldom used by the plan and production department and never communicated to the LSSK or KPI.

But, although one could claim that the resource use within the relief printing shop was governed by a decentralized resource combining, it relied on the supply of paper from the stockroom for paper, matrices from the composition rooms and inks and it was also constrained by the fact that during the year it had to print and deliver a certain volume to the bookbindery. It therefore seems that even though the relief printing shop was governed by a the production staff's combination of the existing resources it was also contingent on the supply of other resources and on the fact that had to deliver a planned volume of forms. As the case demonstrated, paper was a product that was supplied through a strict authority planning system, but also the inks and consumables needed in the composition room were supplied through the plan. This observation dominated the resource combining in both the stockroom for paper and the composition room.

These two situations, a strong authority planning in the composition room and in the stockroom for paper and a planning governed by resource combining in the relief printing shop influenced the relationships between these three administrative units. This also meant that in the relief printing shop the resource use was characterized by a use of knowledge gained through participation in the resource combining, but, of course, within the frames of what was delivered and should be delivered according to the plan. However, especially the composition room but also, to a smaller extent, the composition room was also governed by information possessed by the plan authorities and distributed to Tipografiya as formal production plans.

The reason why the composition room was not completely planned by the authorities was that it was more complex and contained more resources and a bigger variation of these resources in terms of tangible and intangible resources than the majority of the other administrative units. It also involved resource like the setters' experience and the linotype machines, which was more difficult to plan from the outside.

Thus, this leads to the *third* observation, where it seems that resource that are partly planned by remote authorities and partly governed through combining of resources, result in a situation where there is a narrow range and low frequency of the interaction.

These observations seem to be valid in the planned economy, but as the two authorities disappear and the institutional framework changes, the conditions became different. The case shows that the three observations just made, step-by-step, become obsolete and much less valid. As the plan orders from LSSK and KPI stopped coming in, Tipografiya began to manage the supply itself. In the process that followed Tipografiya first continued, for instance, to buy from the same suppliers as during the planned economy, but gradually it changed suppliers or ways to buy.

As LSSK and KPI disappeared, the planning of the resource use at Tipografiya gradually changed. At Tipografiya a new administrative unit, the business center, partly aimed to manage the planning of the relationships in relations to the regional branches, was founded. More people became involved in these activities. Furthermore, the business center had to make contact with the customers in order to plan the resource use. It followed that a new type of planning, relationship planning, emerged. The main issue for the relationship planning was to match and integrate the Tipografiya's and its customers' and suppliers' planning so that they fit into each other.

Integrating the planning was not only an issue in the relationships with customers and suppliers. The managing director and the chief engineer now took care of the purchasing and thus both supplies of paper and consumables were now managed by people neither involved in the internal resource combining nor in the relationships with the customers. One can see that knowledge gained through resource combining s become more important for the planning, but there are still evidences that some of the administrative units are dominated by planning performed by actors not involved in production.

The third observation about the planned economy was that there was a narrow range and low frequency of the interaction. Integration and matching between different plans and planning and resource combining requires a more wide interaction and of a more frequent type than was the case in the planned economy.

Knowledge use

In the interaction between various resources, the case indicated that different types of knowledge possessed by different actors were produced and used. There were three main types of knowledge were evident in the case, however, not always used.

The first and most obvious type was the information distributed by the plan authorities to Tipografiya and other firms. This type of knowledge was to a minor extent based on experience about production of forms. It was to its character explicit and codified and it was communicated in a written form and it was a top-down communication. This information did not interfere in the interaction of the resource, but set up the frames for what was possible to plan and which resources that were possible to combine. Typical was also that this information was almost theoretically produced and thus relatively distant from the actual use of the resources. Knowledge, which was produced as a result of resource interaction was seldom transformed into information and incorporated in the plan. Consequently, one could say that plan and resource combining were separated from each other.

The second and third type of knowledge is both produced locally when resources are combined and when plans are made by those who use the resources. The first type of locally produced knowledge can be labeled experience gained from planning and combining resource at Tipografiya. This use-based experience was closely linked to everything people did at Tipografiya, however, only as long as it did not break the intention of the information distributed by the plan authorities. The case did not show any strong links between the information distributed from the plan authorities and the experience used in the coordination of the relationships between various units.

The third type can be called passive knowledge and was also a result of resource interaction, but as it did not fall within the frames of what was permitted according to the official plan, it could not be exploited outside the focal interaction. Thus in opposite of the use-based experience, which was activated, this knowledge was passive as the formal hierarchical plan constrained and restricted the use of this knowledge, which was gained through resource interaction. The passive knowledge was not only something that the employees involved in composing and printing gained; instead the passive knowledge concerned several aspects of the daily operations. Most striking in the case is the passive knowledge that concerned the resource combining. For instance, how to combine printing press, inks and paper in order to achieve an acceptable

form. But the passive knowledge could also have to do with the planning of the resource use, that is, when to print the forms in relation to the remaining production or the delivery of the paper from the paper suppliers. Finally, the passive knowledge that could not be used was a result of the relation between planning of use and resource combining in the interactions. Since authority planning was so dominant in Tipografiya, passive knowledge also tended to be big. A lot of knowledge was not used outside the context where it had emerged.

Changing ways of using resources through new knowledge increased the uncertainty perceived. This was the case both for Tipografiya as a whole and for the six administrative units. The only change that was welcomed by, for instance, by the stockroom for paper was a change that made plan fulfilment easier to achieve. Thus, change forced the firm to learn, which increased the uncertainty and the possibility of failure. Therefore, the firm tried to avoid changes. The relief printing shops could more freely learn by doing. An example of this was, of course, how people in the relief printing shop learned how to use a paper from a specific supplier in combination with a specific printing press and specific type of ink.

This observation did not exclude the fact that individuals at Tipografiya learned more when they combined resources, but it showed that this knowledge was mostly related to their own administrative unit as wide and high frequent interaction took place between resources within the unit and not between units. It might even have been the case, that the administrative units strived to minimize the interaction the plan was not compatible with the use.

The movement to a new economic system meant a change in the use of knowledge. As LSSK and KPI disappeared there was no room for codified information in the form of plan orders. This was partly replaced by written contracts, price lists, product specification etc. exchanged between Tipografiya and its suppliers and customers, but still it differed from the planned economy as they were usually accompanied by negotiations and both formal and informal information exchange. Moreover, the new codified information was not as definitive as the plan orders used to be. It was to some extent negotiable and subject to changes.

This was, in turn, a consequence of the emergence of relationship planning and integration of resource combining in and between the administrative units. As the codified plan information gradually lost its importance, experience gained from planning and combining resources became more important both for how resources were combined and how this was planned at Tipografiya and in its relationships with customers and suppliers. Thus, in parallel to the codified information losing its importance, the passive knowledge could be used in a larger extent than before. Some of the passive knowledge, especially about the resource combining in the administrative units, was activated and used. This does not mean that the passive knowledge completely disappeared. For instance, supply of paper and consumable was managed by the managing director and the chief engineer, and although they did not have any background in the printing industry they preferred to make all their decisions without taking advice from the people in the six administrative units. Thus, one can say that much knowledge about how to combine paper and inks in the production of paper was still was passive.

Interaction

The case demonstrated that much of the resources combined in the production were characterized by something that can be called decentralized resource combining. This concerned, for instance, the physical facilities, machines and equipment and human resources, where the resources were combined and activated rather independently from the plan authorities. But this observation was not valid for consumables, which were coordinated by the authority planning system. This meant that every combination of resources, which consisted of, on the one hand, physical facilities, machines and equipment or human resources, and, on the other hand, consumables like paper or ink, was also consisting of knowledge related to both planning and combining resources. In a relationship between, for instance two administrative units, where strict decentralized combining met strict authority planning a situation, we tended to see, besides resource interaction with a narrow range and a low frequency, resources, which did not fit into each other and where there were few attempts to adapt the resources in the combination. Finally, owing to the collision between governance through authority planning and governance by decentralized resource combining there were few mutual adaptations.

In the case, this was evident in the relationship between the stockroom for paper and the relief printing shop. The stockroom received paper through the planning system and could not influence volumes, price, quality, supplier etc. The relief printing shop, on the other hand, could be viewed as a place, where several resources were combined in order to print the forms. In the relief printing shop the staff had relatively big room of maneuver and could chose how to combine various consumables with facilities like printing presses.

The misfit in this interaction was a result of the fact that the stockroom either had to store too much paper or too little paper in relation to the relief printing shop's needs, which, in turn, meant that the forms were either printed on yellow and wavy paper or printed too late. This was not a deliberate decision, but a consequence of the collision of authority planning and decentralized resource combining. This misfit could

have been solved through mutual adaptation of the resources used in the interaction but as the stockroom of the paper was hierarchical planned it could not influence the volumes or qualities of the paper. In the stockroom other resources like, for instance, human resources or the physical facilities, which were less strictly planned, could be replaced, but that would not change the supply of the paper. It seemed, firstly, there was difficult to achieve compatibility between authority planning and the resource combining in the interaction, and, secondly, that there was difficult to bring fit about resources and to make adaptation in the interaction, where authority planning and decentralized resource combining collided.

The misfit between the resources used in the interaction where authority planning met resource combining, but it seemed that learning in the case rather took place within each separate unit and was less related to the interaction. It is even so, that the narrow range and low frequency of interaction made up a weak foundation for mutual adaptations. An additional constraint was that the authority planning established what to learn based on completely different conditions than the conditions which were a result of the resource combining in the interaction.

The authority planning did not permit flexibility, but was instead simple and taut to its nature. Although the a weak authority planning of the combining of the resource opened up for interaction between the resources within each administrative unit and a development of new ways of combining resources, the stiffness of the authority planning meant a narrow range and low intensity of the resource interaction. This division of interaction of the resources also meant that on-going interaction between resource and the change of the interaction between the resources were separated, that is changes were initiated and made without taking resource interaction into consideration. The authority planning's dominance over the resource combining meant that most changes occurred as a consequence of planning and were not a result of combining resources. Altogether this meant that the static interaction either changed in minimal steps, which either took place within the frames of what the planning permitted or were huge and as such a consequence of giant and planned steps.

As observed the transition to a market economy meant a change of planning how to use resources, expansion of the resource interaction, which, in turn, resulted in activation of the passive knowledge. In the previous section relationship planning was taken as an example of this. It seems that this change first took place within the administrative units. More attention was paid to the combination of products and facilities within the administrative units, which required that the passive knowledge about this was activated. It was also necessary that the authority planning was abolished.

The second phase in this process was when the relationships between administrative units within Tipografiya, like, for instance, the relief printing shop and the composition room started to interact adapt their use of resources to each other.

The third phase, which just started in the end of the case concerned relationships between firms. In these relationships two firms' resource combining met and gradually began to interact. In order to manage them firms begin to perform relationship planning, which, in turn required that the authority planning was abandoned and passive knowledge was activated.

Discussion

The case covers the period from the middle of the 1980s up to the new millennium and follows the process from a planned economy, through the transition period to something that could be a market economy. This process in terms of knowledge use, planning of the use of resources, combining of resources and character of the resource use is summarized in Table 3. It shows some significant characteristics of the three systems, but also the changes of use of resources that take place. This could be described as four movements which follow a specific logic, but these movements are also inter-related and do not take place in isolation from each other.

The most striking observation on production and knowledge use concerns the fact that all three systems tend to produce codified information, passive knowledge and experience from combining resources, but that these three types of knowledge are differently used. The codified information in terms of plans lose its importance during the transition and its importance is instead replaced by the experience gained from planning and combining of resources. In parallel, the passive knowledge, which tends to be so big in the planned economy, is activated during the transition. This movement does not imply that codified information and passive knowledge does not exist in a market economy, but that their role is different.

Planning how to use resources is a necessary activity in any economic system, but it seems that it has different characteristics in the three economic systems. The planned economy, means, of course, a taut and extensive authority planning, which during the transition period disappears and is replaced by firms developing their own planning function and that they perform the planning in house, however, without relations to other firms in the economy. But as firm planning without relations to other firms sometimes result in mismatch of production times, qualities, delivery times, etc. The firms in a market economy step-by-step

introduce planning of resource, which is inter-related. This relationship planning bridges two firms' internal planning of resource use, which, in turn, is linked to how resources are combined. An important and necessary aspect of this movement is the transformation of the passive knowledge into experience from combining resources. Bridging firm planning requires experience from both planning and resource combining.

	Planned economy	Transition economy	Market economy
Knowledge use	Codified information in terms of plans A lot of passive knowledge is produced Little experience from resource combining is used	Information in terms of plans disappears Passive knowledge is activated Experience becomes critical for both planning and combining resources	Locally produced knowledge tends to be more extensively used and less passive. Codified information for planning have lost much of its importance
Planning of the resource use	Authority planning dominates Firms' internal planning is weakly developed	Authority planning disappears Firms develop internal planning	Firm's planning is linked to other firms' planning Relationship planning emerges
Resource combining	Resource combining is separated from planning Resource combining had minor effects on knowledge use and planning	Resource combining and planning tend to integrate As experience becomes more important combining resources also increases its importance	Special functions and activities are developed to link planning and resource combining
Character of interaction	Narrow interaction and poor matching	Interaction expands and adaptations grow	Wide interaction and matching of resources

Table 3 Summary of resource use in different economic systems

Consequently, the planned economy means that use of resource is characterized by a separation of planning of use from combining of resources. Moreover, the experience gained from combining resources is not used in the planning. However, as the authority planning is dismantled, planning is decentralized to the firm, which means that combining of resources and planning tend to integrate. This integration means that experience becomes more important, which, in turn, leads to that the combining of resource increases its importance. Moreover, this integration does not take place in a vacuum. The case indicates that special functions and activities are developed to link planning and resource combining.

The planned economy means that owing to the big volume of passive knowledge and that the experience is not used, the authority planning and the separation of planning and resource combining tend to mean a narrow interaction and poor matching of resources. But, as firms develop internal planning and passive knowledge is transformed into experience from planning and combining of resources as the resource interaction expand. But, the expanding interaction requires changes of the knowledge use. Both passive knowledge and codified information loose much of their importance and instead experience from planning and combining becomes critical. This new type of planning could be called relationship planning, where firms jointly plan how to use the resources. The development of relationship planning is accompanied by appearance of special functions and activities, which, in turn, is needed a wider resource interaction and a matching of resources.

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