BENCHMARKING OF SYSTEMS AND LOGISTIC PROCESSES
IN SELECTED EUROPEAN POSTAL OPERATORS AND
POLISH POST

Introduction

Progressing liberalisation of the postal market makes the postal operators compete also in
the field of postal logistics. Increasing competition and rising customers’ requirements, which
open up the traditional postal market for CEP operators, and even TSL (transport, shipping,
logistics) makes logistic systems and technological processes especially attractive for operators.
Only effectively built logistic system, based on the efficient flow of mail stream, can ensure
reduction of time and costs of service performance (i.e. drivers which mostly decide of operator’s
market position).

Deutsche Post AG

One of the leaders in the logistic field, the owner of such brands as DHL or Danzas,
possesses very coherent and simple logistic system (figure 1).

Two separated divisions MAIL (letters) and EXPRESS (parcels) are responsible for
effective flow of mail stream. Despite the fact that the majority of sorting centres for letters and
parcels are located in the close distance to each other, logistic system of Deutsche Post provides
for a separate system for letters and parcels. It should be stressed that, in spite of separation of
streams of letters and parcels, both systems are exceptionally unified. It allows for repetition of
particular operations and stages of process, what differs is the subject of operation. The logistic
process of German operator contains the following operations:

Sending – mail is collected by means of vehicle transport, the letter boxes are emptied for
the last time at 19.00, in that case, the operator guarantees delivery the following day (J+1). It is
also possible to send mail after the deadline hour directly in the sorting centre.

Concentration (collection) – handled by means of vehicle transport by sorting centres.

Sorting in the centre „outbound” – sorting takes place on the basis of the first two digits
of postal code (cargo for the 82 remaining centres are processed on „each with each” basis); mail
destined for its own area of operation are at this stage sorted for delivery routes.
Sorting process takes place continuously around the clock, which allows for effective use of sorting machines. Mail arrives to sorting centre in boxes, different for each type and category of items. The first stage of sorting includes preliminary sorting which is followed by detailed sorting for particular destinations. Generally, approx. 85% of mail volume undergoes automatic sorting.

Process of sorting mail to be delivered the following day (J+1), destined for other centres, occurs between 14.00 and 21.00. Mail to be delivered within the area of activity of the centre is sorted between 21.00 – 6.00 (J+1). In the course of the day, the mail with late delivery time is subject to sorting. Generally, sorting process is characterized by cyclic work schedule, i.e. the same machines are used for sorting mail with the highest time sensitivity (J+1) first, and then mail with a longer delivery time. Organisation of work in the centre reflects the one commonly applied by other operators: collection, deconsolidation, sorting, consolidation, shipping.

Conveyance between centres – in terms of BRIEF 2000 programme, German operator has drastically modernized its logistic network. As a result, by the end of 20th century, a lot of investments were made: 83 modern sorting centres were built from scratch or modernized, whereas a number of years before 328 smaller postal centres had been operating, mostly based on manual sorting. Such investments resulted in the rise of on-time delivery indicator: from 75% of deliveries J+1 in 1990 up to approx. 95% after completion of BRIEF 2000 programme.

Conveyance between centres is handled with the use of direct connections or transhipment points (so called „hub and spoke”). It reflects star-shaped system of logistic network, where the key role is player by one point (airport at Frankfurt-on-the-Main), (de)concentrating the cargoes from various directions. Figure 2 presents the framework of the logistic network of the German operator including the most important (from the point of network) sorting centres together with key transport connections.

Above all, the location of centres is characteristic of logistic network of Deutsche Post. They are based in the main economically developed regions of Germany and in the vicinity of principal communication nodes (airports). Generally, more centres are located in the former West
Germany than in the Eastern regions. It also reflects the different economic development of Germany. Although, 4 centres are located in the vicinity of Berlin. The unbalanced development of Germany causes that the level of saturation of the logistic postal network in the most Eastern regions is the weakest.

Road transport (mainly parcels) constitutes the predominant branch in Deutsche Post transport system. However, the critical role is played by the air transport, which handles majority of letter mail including that with the highest time sensitivity (J+1 delivery). Cargoes are delivered to the airport through road connections. Airplanes with cargoes originating in other centres arrive in Frankfurt around 0.00, after certain time devoted to reloading, airplanes return to home airports. Deutsche Post makes also use of railway connections which link North with the South of the country.

Deutsche Post possesses an integrated informatic application for planning transport network, between centres and internally within the centres. The whole application is based on the use of combination of road and air transport. The major assumptions which the application uses for building relations include: J+1 delivery of mail and possibly the lowest costs of transport. These are typical „trade-up” choices.

**Sorting in the centre „inbound”** – is handled with the use of postal code, which allows for separation of mail for delivery routes, P.O. Boxes and for business customers. The work technology is the same as in the centre „outbound”.

**Figure 2.** The framework of the Deutsche Posts’s logistic network

**Source:** the author’s own study based on: *Pocztowe systemy logistyczne i transportowe…op. cit., pp. 134, 138* and T. Baldry, *Narodowi operatorzy…op. cit., p. 85.*
Sorting stage daily schedule in Deutsche Post sorting centres can be presented in the following time windows:
- 20.00 – the end of concentration of mail by the centre “outbound”,
- 21.00 – the end of sorting of mail collected in the area of operation of the centre “outbound”,
- 04.00 – the end of receiving mail by the centre “inbound”,
- 06.00 – the end of sorting mail in the centre “inbound”.

**Deconcentration (distribution) – is handled in two ways:**
- mail is brought to receiving points (letters), from where they are then delivered,
- mail is conveyed to one of approx. 500 trans-shipment points (letters and parcels), where they are separated for receiving points or collected by addressees.

Trans-shipment points are most often located outside of cities and urban areas, which makes transport optimal. The main criterion, which determines the involvement of trans-shipment point in the process refers to the weight of mail volume carried to that point and its infrastructural capabilities.

**Delivery** – delivery staff has an autonomous organisation structure. Post-persons are not attributed to particular postal outlets. Post-persons deliver approx. 80% volume of mail and the remaining 20% is collected directly by addressees.

**Österreichische Post AG**

Logistic system of the Austrian operator (figure 3), contains similar elements as system of Deutsche Post. Austrian system also possesses separate sorting systems for letter mail and parcels, based on two separated flows of mail streams.

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**Figure 3. Outline of the Österreichische Post’s logistic system**


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1 See also K. Hirsz: *Logistyka Poczty Polskiej w kontekście integracji z Unią Europejską. „Technika i Eksplatacja Poczty”* 2000, No. 1, p. 14.
Two divisions MAIL (letters) and PARCEL & LOGISTICS (parcels) are in charge of both systems and both processes. As shown on the figure, the difference between Austrian and German systems lies in the additional element in the stage of concentration of mail by Österreichische Post, which is a delivery base. It plays the role of quasi postal point processing mail at the “inbound” and “outbound” of the logistic system. The shortly described system comprises a logistic process, which contains the following stages, and can also be observed in the case of Deutsche Post:

**Sending** – similarly to German operator logistic system, mail can be sent via all available ways (collection boxes, postal outlets, post-persons, receiving from business customers). The significant difference between both systems is that the Austrian operator does not apply the uniformed deadline time for sending mail. That time is dependant on the location of a particular collection box or postal outlet in the area of which a collection box is placed. In fact, the deadline time for sending mail depends on the distance from the “outbound” centre.

**Concentration** – is handled in two stages:
- Selected outlets (approx. 1.9 thousand) collect mail form the collection boxes on its premises,
- Mail is subsequently conveyed by road transport to delivery bases.

On the territory of Austria, there are around 380 delivery bases. Over the years 2001-2005, this number was dramatically reduced from approx. 1.8 thousand. As mentioned above, these bases not only deal with collection of mail but also with delivery, which makes them very universal. Majority of bases are located outside the collection outlets. There are also joint locations, however, the principle of separation of two streams (inbound and outbound) is sustained. The specificity of delivery bases is characterised by the fact that they do not handle sorting of mail, but they are focused on consolidation of cargoes and its conveyance to appropriate delivery centres. After delivering mail to delivery bases, mail is put together into larger sets. These operations are mainly handled without mechanical support.

**Sorting in a centre „outbound”** – until the beginning of 21st century, this phase had been taking place in 39 stationary centres and in many movable centres (railway post offices). In 2006, the number of all centres was reduced up to 6 letter centres and 7 centres handling CEP mail (6 joint locations with letter centres). Sorting of mail aboard trains was also discontinued. The logistic network of the Austrian operator was considerably reduced. For instance, 3 centres in Vienna situated close to railway stations were replaced by 1 centre equipped in the world class machines for automatic sorting of mail.

All sorting centres are automated, majority of them fully automated. Operator aims at achieving 100% mechanized logistic process. Organisation of work is traditional, similar to that in Germany: collection, deconsolidation, sorting, consolidation, shipping, irrespective of subject of operation (letters or parcels)

Sorting in Austrian centres is also based on postal code and has cyclic character. It is worth noting that in 2005 approx. 25% of letters flowing through “outbound” sorting centres was already sorted to delivery routes, which proves that Austrian operator uses the most advanced postal technology. Operator also aims at preparing the biggest possible mail volume for the last mile delivery process already at the “outbound” in the “inbound” centre.

Gradually developed technology process, supported by a significant technological progress contributed to considerable reductions of the links in the technological process, eliminating smaller postal hubs.
It also largely improved the quality requirements which are fulfilled by the Austrian operator: 95% deliveries in J+1, 98% in J+2 (letters) and 90% in J+2 (parcels). In 2006, Österreichische Post met all quality requirements in terms of time deliveries, although in 2002 this indicator did not exceed 70% of deliveries in J+1, and in 2003 r. rose to approx. 84%.

Conveyance between centres – Österreichische Post, due to, among others, small size of the country, comparing to Germany, does not use air transport for conveyance of mail, despite very favourable location and availability of airport public network. The vast majority of mail is transported by means of vehicle transport, in spite of the fact that the large part of the country is mountainous and covered with icebergs. The most important connections used by the Austrian operator embrace all 7 sorting centres. Due to the use of trans-shipment points, cargoes are exchanged on the „each with each” basis by all centres. Railway transport also plays quite a significant role in the logistic network of the operator. Despite conveyance of relatively small mail volume, it provides a significant support for vehicle transport network. The figure 4 below depicts the framework of logistic network of Österreichische Post (all centres and key transport connections).

As the above figure shows, the shape of logistic network of the Austrian operator differs largely from the one of the Deutsche Post. The network of Österreichische Post is spider-shaped, which means that there is not any central point (such as an airport in Frankfurt), accumulating cargoes coming from various directions and sorting them to particular destinations.

Sorting in a centre “inbound” – work organisation in this centre is the same as in the “outbound” centre. Mail is sorted directly for delivery routes, with an exception of this part of volume which has already been sorted in that way.

Deconcentration – handled with use of fleet vehicles.

Delivery – handled by delivery staff situated in delivery bases.

In summary, Österreichische Post’s logistic process may be characterized by its daily performance schedule, which for mail items of the fastest category (J+1), can be comprised of the following time windows:

- 16:00 (J+0) – 18.00 (J+0) – concentration in delivery bases,
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- 18:00 (J+0) – 20:00 (J+0) – conveyance to centre “outbound”,
- 20.00 (J+0) – 22.00 (J+0) – sorting in centre “outbound”,
- 22.00 (J+0) – 02.00 (J+1) – conveyance between centres,
- 02.00 (J+1) – 4.00 (J+1) – sorting in centre “inbound”,
- 4.00 (J+1) – 6.30 (J+1) – conveyance to delivery bases,
- 6.30 (J+1) – 8.00 (J+1) – deconcentration in delivery base,
- after 8.00 (J+1) – delivery

Logistic system and process of the utility state owned enterprise Polish Post (PP)

PP’s logistic system – figure 5 – does not provide for separate letter and parcel centres (like it is in the case of Germany and Austria). The separation of both mail streams occurs only on the selected process stages, which is not conducive to optimization of the whole process due to for ex. necessity of performing the majority of operations simultaneously both for letters and parcels in the same centres.

Figure 2. Outline of the Polish Post’s logistic system

Source: the author’s own elaboration.

It is worthy of noting that the logistic system and process of PP has a few “owners”, which is another disadvantage in comparison to postal world trend. The fact that a few organizational units are liable for one system and process jeopardizes effective functioning of operator’s logistics, because such dispersion of responsibility triggers sub-optimisation effect of smaller logistic areas of the operator. Consequently, the decision process based on “trade-up”, or “trade-off” is more difficult and takes longer.

The logistic process itself is much longer comparing to processes of Deutsche Post and Österreichische Post and comprises the following stages:\footnote{2 See also K. Michalski: Kowalski nadaje list do Malinowskiego. Od skrzynki do skrzynki, czyli system logistyczny w Poczcie Polskiej. "Eurologistics" 2006, No. 6, pp. 86-91.}

**Sending** – via postal outlet, collection boxes, post-person or collection by a customer; 15.00 h. is a deadline time for sending mail in the category J+1.

**Concentration** – (vehicle transport) collection of mail from the area of all 52 hub\footnote{3 Including 14 sorting centers.}, depending on the location of a hub, terminates by 16.00 h.
**Sorting in a hub** – after distribution of mail to 51 hubs (on the basis of 3 first digits of postal code), it is put together in a larger sets, depending on production capabilities of a hub; this stage usually lasts till 17.00 h.

**Conveyance to sorting centre „outbound”** – conveyance to one of 14 sorting centres (vehicle transport), depending on location of a centre, this stage usually lasts between 17.00 – 18.30 h.

**Sorting in a centre „outbound”** – consolidation of cargoes from the area of several hubs, putting them together in larger groups transported between centres.

**Conveyance between centres** – based on road, flight and railway connections; air transport network as critical for J+1 is based on accumulation of cargoes at the Warsaw Okęcie airport at 22.00 – 23.00 h.

**Sorting in a centre „inbound”** – deconsolidation of cargoes into smaller parts, for target hubs.

**Conveyance to a hub** – depending on location of a target hub, this stage lasts between 2.00 – 4.00 h., based on vehicle transport.

**Sorting in a hub** – detailed sorting (based on two last digits of postal code) for postal outlets, this stage lasts between 4.00 – 6.00 h.

**Deconcentration** – mail distribution on the hub premises, delivery of mail to postal outlets last between 6.00 – 9.00 h.

**Delivery** – handled by selected delivery outlets.

Cursory evaluation of logistic process of PP enables to identify chain links and process stages (i.e. double sorting in hubs) which do not occur in above analyzed systems of Germany and Austria. The reason for that is that only a few sorting centres are equipped in sorting machines, which eliminates the possibility of detailed sorting of mail or sequencing for delivery routes at the beginning of the process.

Moreover, due to the fact that predominant part of job is done manually, the particular stages of logistic process in PP are considerably longer. Therefore, there is no one, universal logistic performance schedule of PP, basically because of varied location of centres in logistic network, which determines time that the centre has for performance of the particular stage of the process.

Firstly, in view of increasing mail volume, poor level of logistic process automation puts a quality of postal service in danger. The quality (time delivery indicator) has observed a significant slump in 2006, below the guaranteed limit: 68.22% deliveries in J+1 (limit: 82%)4. Obviously, the technological underdevelopment of PP’s logistic system and logistic process do not directly account for bad quality results, but definitely it is not conducive to the improvement of this unfavourable situation.

Secondly, time performance of the logistic process of PP, especially for mail items of the fastest category (J+1), is determined by non-inclusion of some centres in the air transport network (cargoes from these centres – in the east and north – are transported on road routes to Warsaw’s airport). The framework of logistic network of PP, as presented in figure 6, is partly mechanized but majority of operations are handled manually, which slows down the process.

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4 See also Raport z badań jakości powszechnych usług pocztowych w zakresie wskaźnika terminowości doręczeń przesyłek oraz w zakresie informacji o ilości i rodzajach zgłoszonych reklamacji oraz sposobie ich rozpatrzenia, „Biuletyn UKE 2007”, No. 5.
Thirdly, another factor noticeably delaying logistic process of PP is the lack of teleinformatic system combining at least the framework of operator’s logistic network. Due to such a support, information that is once introduced into the network of Deutsche Post and Österreichische Post, is conveyed along with a mail item and has a number of functions: preceding, accompanying and reporting with reference to physical mail stream.

Location of sorting centres reflects main economic regions of Poland, however, the shape of logistic network, especially flight connections, have been established historically as the most accessible, taking into account the accessibility to public transport network (flight, railway).

Logistics of PP as benchmarked against logistics of German and Austrian operators.

The whole logistic network of PP undergoes nowadays the transition period. The target model is 6+2+12\(^5\), based on the following assumptions present in the logistic systems of Deutsche Post and Österreichische Post:

- 6 A class centres (mechanized), out of which 4 are already in place: Warszawa, Poznań, Gdańsk and Wrocław, and 2 are still under construction: Katowice and Lublin,
- 2 A class centres, in place, being modernized for new network: Łódź and Kraków,

\(^{5}\) Logistyka szybkiego reagowania. „Poczta Polska” 2007, No. 3, p. 7.
- 12 remaining B class centres, based on manual work,
- lack of diversification of centres from the point of view of the type of mail processed (centres will process all types of mail),
- star-shaped system of flight connections (following the pattern of existing PP’s network and Deutsche Post’s network), which can be expanded by new flight connections along the development of airport public network; it basically refers to the east and north part of the country,
- spider-shaped road system (following the pattern of existing PP’s network and Österreichische Post’ network), which combines all centres on “each with each” basis, through trans-shipment in centrally situated hubs,
- elimination of regular railway connections, due to placing new centres outside the urban areas, in the vicinity of road nodes (motorways, express roads).

Investments made into logistic network of PP will considerably reduce the logistic process, among others due to elimination of separation of mail in hubs. Eight, out of twenty centres remaining on the map of PP, will be fully equipped in the world class sorting machines. The target model of PP’s logistics shall be achieved within a few coming years.

Conclusions

Summing up, it should be stressed that PP’s existing logistic system seems to be at a distinct disadvantage being benchmarked against systems and processes of Deutsche Post and Österreichische Post. However, it should be kept in mind that both these western operators underwent similar path and several years ago their logistic systems and processes were equally obsolete and unadjusted to new market conditions. The fact that some elements of the logistic systems observed in Germany and Austria are present in the PP’s target logistic model 6+2+12 proves that the PP is on the right path.

**BENCHMARKING SYSTEMÓW I PROCESÓW LOGISTYCZNYCH WYBRANYCH OPERATORÓW POCZTOWYCH W EUROPIE ORAZ POCZTY POLSKIEJ**

**Streszczenie**

Artykuł koncentruje się wokół głównych zagadnień logistyki pocztowej operatorów publicznych Niemiec, Austrii i Polski. Celem artykułu jest identyfikacja trendów i zjawisk charakteryzujących analizowany obszar działania Deutsche Post i Österreichische Post – operatorów, którzy przeszli podobną ewolucję, u progu której znajduje się dzisiaj Poczta Polska – a następnie odniesienie ich do praktyki funkcjonowania polskiego operatora, zwłaszcza w świetle planowanych zmian w obszarze systemu i procesu logistycznego.