

Who Puts the Stripes on Letters?

Drop Off Before the Day's Final Emptying – Next-Day Delivery

By Peter Sonnleitner

As one of the internationally leading postal communications and logistics companies, the Deutsche Post (German postal service) has significantly improved the delivery time of letters with its concept "Brief 2000". Last year, 95 out of 100 letters had reached their intended recipient within one day. The average delivery time is 1.06 days. At the beginning of 1994, only 83 out of 100 letters were delivered after one day.

These fast delivery times within Germany are possible due to the meticulous collaboration of postal centers, transports, overnight flights and an ingenious IT.



From sender to recipient: After dropping a letter into a mail box of the Deutsche Post...

...the box is emptied...

...and the letter begins its journey through the modern letter sorting system in a letter center.

At the Beginning

When the implementation of "Brief 2000" began, the first step was taken towards renewing the coding and sorting process at the Deutsche Post. The goal was to considerably increase the number of postal items that can be read and coded by machine. Additionally, the 'E+1' project (drop off before the day's final emptying – next-day delivery) was to be realized for a major portion of the postal items.

Until that time, a personnel-intensive and list-based process controlled the sorting at the German Postal Service. This required a high level of effort and

manual maintenance. The intention of the concept was to implement a vendor-independent, decentralized and database-supported solution for the future to provide management and process control of coding and sorting information.

A system for the maintenance of code-relevant data for letter processing was created as part of the concept. MaK Data System participated considerably in the project 'Best' (business database).

MaK Data System organized and provided workshops at the beginning of the project and created the technical concept. The project's technical reali-

zation was achieved through the teamwork of consultants and postal service employees.

The Project Best

In 1997, MaK Data System began with the workshop in Darmstadt. The workshop was organized together with the department for technical sorting located at the service center, 'Produktion Brief'.

Together with the department for technical sorting, an application surface was interactively designed in the workshop using a prototype process with Natural Lightstorm (NLS, now Natural

for Windows) and was presented to employees from the areas of IT and the letter center. During the course of the workshop, new ideas were immediately put into action, dialogs were sketched and process order flowcharts were presented. After three days – piece by piece – the base for the future dialog application emerged for the maintenance of coding relevant information.

Following this, two IT specialists from the postal service's department for application development for marketing and sales at the service center, IT Sys-

tem Brief, in Stralsund were trained in NLS during an additional workshop. General standards and guidelines were determined and a suitable control process for the dialog flow was developed.

Under these conditions, the first version was developed at different locations. Following this, further development and support were offered. With the participation of MaK Data System, a total of three versions of Best have been developed over the years. The latest version was put into production at the end of October 2000

with the help of the IT department for application development, Produktion Brief 2. It has been running error-free and stable since then in all 83 letter centers throughout the nation. There are approx. 170 existing installations on Windows NT computers among the individual support locations.

The Best application was used for the maintenance of the relevant coding data during letter processing. The data which is maintained in Best is forwarded to another application, Vibris (version management in letter sorting technology systems). Through this,



The sorting system automatically reads the field of the recipient and marks the letter with a bar code.



If an address is not automatically readable, a video picture of the address is taken and sent to a coding place where the data is entered manually.



After the letter has been allocated to a target letter center, the journey continues during the night together with millions of other letters on their way...

Vibris recognizes the current postal code information (PLD), which is the national zip code information.

Within the application Vibris, all data is distributed to the sorting systems so that the data that is maintained in Best can be appropriately accessed and interpreted during the sorting and coding.

More specifically, Best supports the maintenance of relevant coding data: city, city sector, street, large mail recipients and holders of postal boxes. During the data maintenance process, plausibility tests determined by the technical side are performed and run before saving. This occurs via RPC

access to a host in Berlin. In contrast to the previous procedure with local data storage in the individual letter centers and a periodical comparison of the entire data set, the data is saved centrally on the host in Berlin and is immediately available to all letter centers.

The so-called 'relevant and alternative' forms of writing are also maintained in Best. They allow the postal service to correctly code the recipient's address regardless of errors or mistakes in the city, city sector or street. Eventually, even letters such as these should automatically reach the correct letter center and find their way into the correct mail carrier's bag.

Additional house and post office box addresses of large mail recipients and postal box holders with their respective re-coding references are also maintained in Best. This ensures that mail is correctly delivered, even if there are discrepancies between the physical address and the postal address of a company.

In Best, this data is combined with current data from LOS, the directory containing all address data. All national zip codes, cities, streets and street divisions are stored in LOS.



At the target letter center, the bar code is read and evaluated. A commissioning system sorts the letters for each mailman.

Finally, the mailman delivers the letter to it's recipient – by wind, weather and tide...

(Source: Deutsche Post; Photos: Deutsche Post, Fred Peer, Ch. Dalchow, Ludger Wunsch, Hansa-Press)

The Bar Code on the Letters

Now what does this have to do with the pink or orange colored stripes on envelopes?

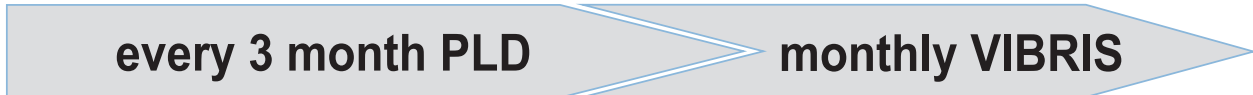
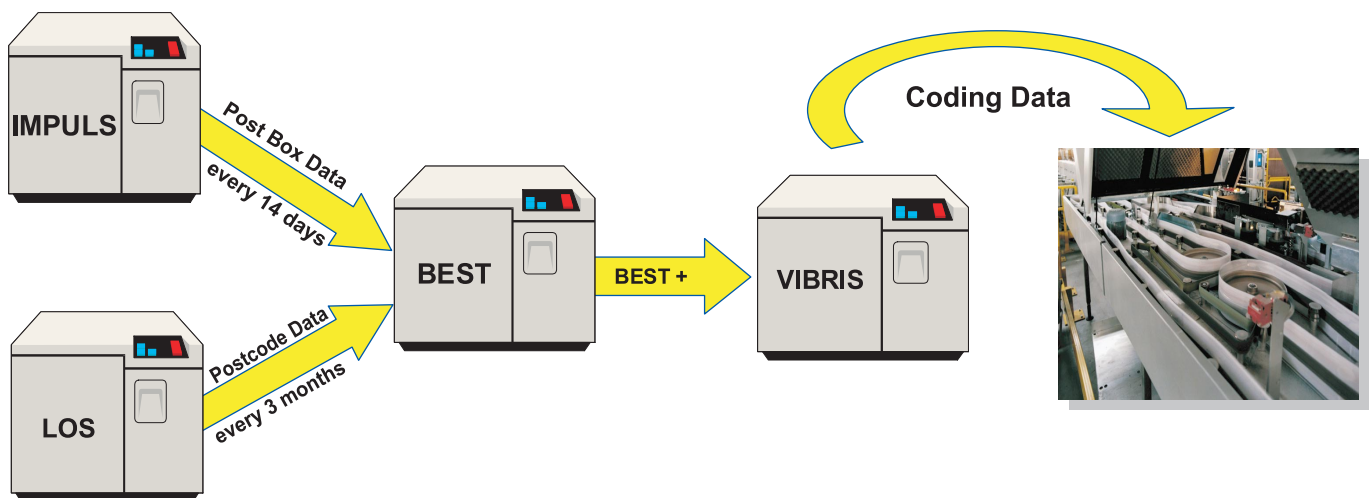
Quite simple: the scanning equipment in the letter centers are "fed" in regular intervals with the data from Best and LOS. The Vibris application is responsible for the correct coding and sorting.

By the automated reading of incoming letters the address area is scanned, interpreted and then translated into an eleven-digit bar code that is printed on the envelope. The zip code, street, and house number of the letter recipient are concealed in this code (see box on page 14).

During the continued processing of the letters, these are then sorted and packed for delivery according to the target address.

After the delivery to the correct letter center, the letters are then sorted once more automatically by interpreting the bar code. The letters make their way, presorted, into the yellow plastic boxes that are filled according to the delivery district of each individual mail carrier. During the sorting, the order of the delivery is taken into consideration. The mail carrier receives the deliveries sorted by street side and house number according to the route he follows.

Operational Data Flow



Technical Description

Now just a few sentences concerning the technical environment in which the project Best was realized:

The development environment was Natural Lightstorm (later Natural for Windows NT 3.1) on Windows NT 4.0 clients. Adabas is used as database (version 6.2.1 on an IBM/390). The subprograms to access Adabas per RPC are written in Natural 2.2.8. Approximately 60% of RPC accesses are used.

Entire Network 2.1.4 (client) and 5.5.1 (host) are implemented for the communication between client and host. Entire Broker version 2.11 was used as the broker.

We measured the difference in the response times between RPC and RDA in this project to be a factor ranging from 1:10 (access time: 1 second over RPC – up to 10 seconds over RDA). Only the file intensive hits (larger hit amounts in the selection) were depicted over RDA since we

occasionally had reached the limits of the maximum accepted data amounts for RPC accesses.

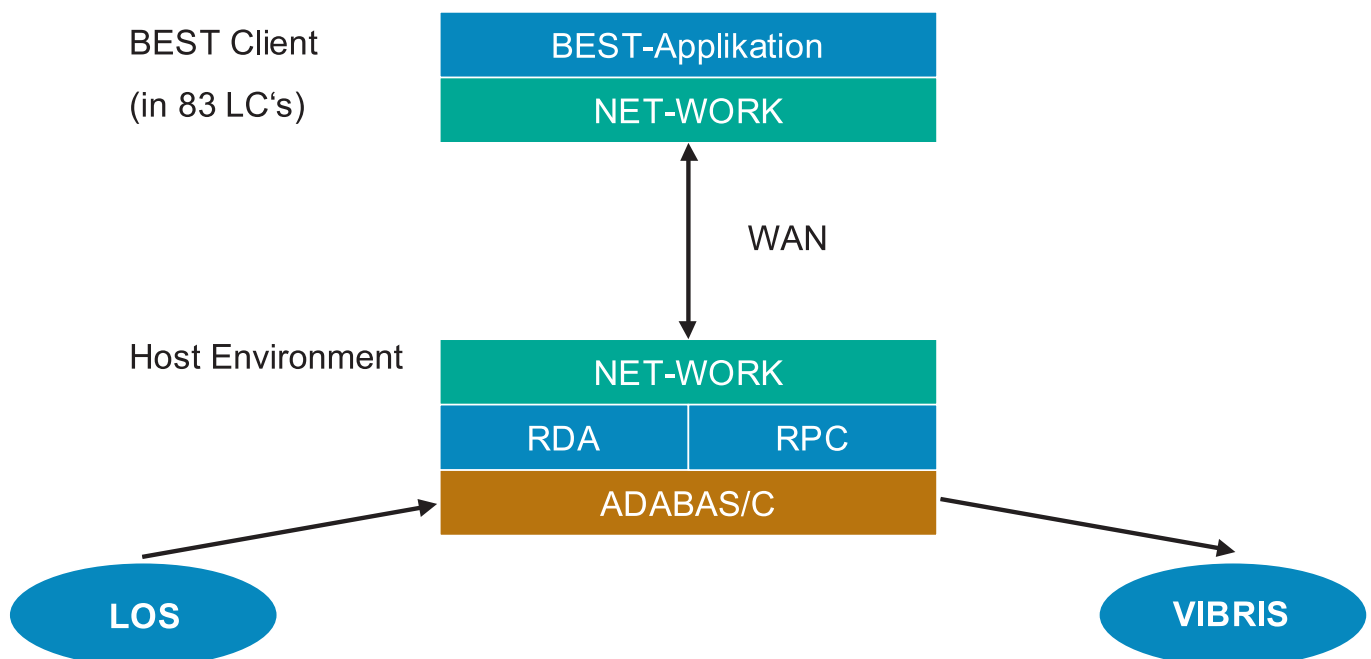
The Deutsche Post carried out the roll-out to the individual workstations, which are spatially scattered across the entire country. Using a tool called TransviewSAX remote installation of the applications was possible. The administrator therefore does not have to be on-site during the installation process.

In Summary

According to Deutsche Post, the "Brief 2000" concept is a complete success. The logistics process of mail distribution has increased its speed and reliability as well as considerably reducing costs. 83 letter centers replace approximately 1,000 letter processing positions where letters were still sorted by hand even in the early 90s. Today over 85% of the letters can be automatically read and

High Volume Client/Server Solution with Natural Lightstorm

BEST's Application Structure



sorted. The modern letter sorting systems can automatically read and sort up to 36,000 letters per hour. The letter centers of the Deutsche Post, depending on their size, have a daily capacity between 750,000 and approximately 4.5 million letters. The required, daily transport trips were reduced from 150,000 to 50,000 due to the precise logistics.

The application Best is operating and stable since the installation of the latest version. The technology from Software AG, which is the foundation of the application, is sometimes considered a bit "dusty". However, the use of the application Best is a perfect example. It proves its functionality in creating high-performance, modern client/server applications that prove to

be reliable in daily operation and use their resources effectively. ■

For further information contact:

Jens Schmidt
 Phone: +49 (0) 431 / 3993-540
 eMail: schmidt@makdata.de

Hot on the Tracks of the Bar Code Secret

At first glance, they are hardly even noticeable. Only those who take a closer look at letters and postcards discover the row of fine lines in a strange shade of pink-orange. They do not come from the sender rather they are printed on postal items by the letter centers of Deutsche Post. All of the information necessary for the automated letter sorting on the way from "A" to "B" is coded in these lines.

The bar code holds the eleven-digit, numerical target information, five digits

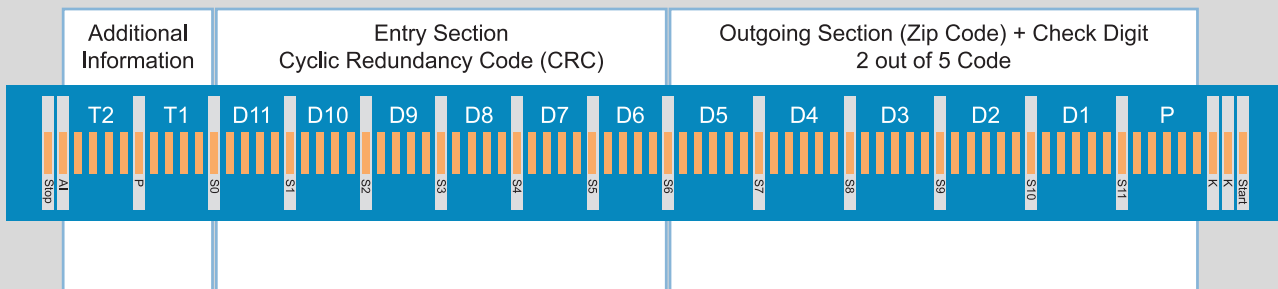
of which are for the zip code, three digits respectively for the street code, the house number or post box number.

The code has two spaces for the processing outgoing letter center and a one-digit computer number to allow reconstruction of coding errors. The sorting machines determine, by means of the integrated check digit, whether the code can be read without difficulty.

Every digit of the zip code is printed in a "3-of-5 code" which means that the zero up to the nine are displayed as three bars in one block with five positions.

Example: 1 = 00111; 7 = 01110

Aside from the provided information, the 80 positions of the current "code 3" contain additional marks for controlling the sorting systems. This information is coded through a different method (CRC).



The 80 positions have the following interpretations:

P	check digit for positions D1 to D5	D6	the hundred of the street code	start	start bar
D1	ten thousand position of the zip code	D7	the ten of the street code	stop	stop bar
D2	thousand position of the zip code	D8	one digit of street code	k	two recognition bars for the used code-format
D3	hundred position of the zip code	D9	hundred of the house number	s0...s11	twelve redundancy bits
D4	ten position of the zip code	D10	ten of the house number	p	parity bit
D5	one digit of the zip code	D11	one digit of the house number	AI	recognition bar for address reader
		T1+T2	number of the letter center (outgoing)		

Source: Deutsche Post