

Chapter 6

Industrial Offline E-Postage Systems

6.1 INDUSTRIAL OFFLINE E-POSTAGE

A number of postal operators have started their offline e-postage system infrastructures and encouraged e-postage providers and mailers to follow. In the following sections, we review the (cryptographically secured) offline e-postage systems that exist worldwide. Our emphasis is on industrial scale offline e-postage systems that are supported by a postal operator and at least one e-postage provider. We present these e-postage systems in terms of the general model introduced in Chapter 2 on page 25.

All offline e-postage devices approved by 2006 are some kind of digital postage meter, which are highly specialized, security-critical embedded systems. To develop and manufacture a new digital postage meter requires a number of key skills including the development and assembly of mechanical and electronic components, the development of embedded application software typically using a real-time operating system, the application and integration of printing technology, the development of new hardware security modules or application of existing ones, systematic product testing and understanding of the postal markets.

6.2 THE CLOSED OFFLINE E-POSTAGE MARKET

The market of postage meters has been an oligopoly, where a few manufacturers share the entire market. After Francotyp merged with Postalia in 1991 and Neopost acquired Ascom-Hasler in 2003, there are three manufacturers left that sell postage meters and provide e-postage on several continents, in particular in North-America, Europe and in the Asia-Pacific region. They are Pitney Bowes, Inc., based in Stamford, CT, Neopost Group based in Paris, France, and Francotyp-Postalia Group based in Birkenwerder (Berlin), Germany. Beside these international manufacturers, there are smaller manufacturers and e-postage providers who are active in regional markets.

The following table summarizes per 2005 some key facts about the international vendors of postage meters such as their annual revenue, number of

employees worldwide, number of operating postage meters worldwide, market share of postage meters, and the number of active patents [29].

Table 17. International Manufacturers of Postage Meters in 2005

<i>Manufacturer</i>	<i>Annual Revenue</i>	<i>#Employ- ees</i>	<i>Post. meters worldwide [1000 pcs]</i>	<i>Market Share Worldwide</i>	<i>Number of active patents</i>
Pitney Bowes, Inc.	\$5,000m	32,500	1400	60%	ca. 5,000
Neopost Group	\$900m	5,000	630	27%	ca. 900
Francotyp-Postalia Group	\$160m	850	250	9%	ca. 850

Digital postage meters are available for different environments ranging from small offices up to large mail rooms. Entry level stand-alone devices are fed manually and can produce up to 10 pieces per minute. Mid-range devices can be connected to peripheral devices such external scales, feeders, and inserters and produce up to 10,000 pieces per hour. High-end devices can be integrated into full blown mail processing plants complete with sorting equipment operating at more than 20,000 pieces an hour. Some mid-range and high-end postage meters can automatically frank mixed mail when they are connected to a dynamic scale, which determines the format, thickness, and weight of a mail piece on the fly.

Postage meters are the workhorses when it comes to frank mail. In mature postal markets, about 15% of all businesses use a postage meter to process their outgoing mail, and their postage meters frank about 60% of all first class letters in the market. By switching the installed base of postage meters into digital postage meters using electronic postage, the large postal operators acquire more accurate marketing data, i.e., usage data, and reduce their losses resulting from meter manipulation at one blow. The following sections present the large industrial franking programs that are currently in operation in the US, Canada and Germany.

6.3 UNITED STATES POSTAL SERVICES

The US Postal Services launched the Information Based Indicia Program (IBIP) for offline closed e-postage systems in January 1999 [100], and offline open systems in June 1999 [101]. These specifications prescribed similar layouts of indicia, all of which included a 2D barcode containing machine readable information including a cryptographic digital signature. Approved