REPORT DECONSTRUCTION - Part 3 How does it work?

3. How does RFID work?

3.1 Communication process

The communication process (represented in Figure 3) is initiated by the reading device.

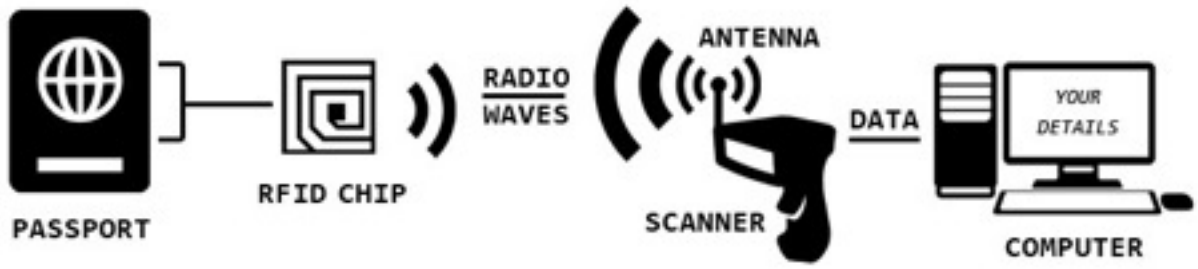

Figure 3. Data communication in an RFID system

Source: RFID transponder by Texas Instruments, 2006; others by Kogler, 2006

This device creates an electro-magnetic field with the same frequency that the responder is listening to. The signal is received by the transponder's antenna, creating an induction current which activates the micro-chip. Passive transponders also use the induction to charge their capacitor; active ones use their battery as an energy source.
Once activated, the transponder is now ready to receive commands from the reading device. Data can be read from the chip to compare with database entries stored on the server (Garfinkel, 2006).

1.What is the function of Part 3.1?

2. What is the function of Figure 3.?

4. What is the function of the 'Source'?

3. Note the tenses which are used in this section

3.2 Energy supply

There are two different kinds of transponders; active and passive which differ in their energy supply and reading range (1).

Since **passive components** do not have their own energy supply, they have to be provided with sufficient energy through the communication process. A so-called 'continuous wave' has to be provided by the reading device to keep the transponder running. Due to the fact that the magnetic field strength decreases with the square of the distance of the transponder, passive components are very limited in reading range. In fact, they can only be read from less than one metre.

Active components, on the other hand, utilise their own energy supply using a battery. Once they are activated by induction of the magnetic field, they don't need any further energy source from the field. Thereby they can be read from further distances. A state of the art transponder is able to radio from distances of up to 10 metres and greater distances, using higher frequencies are currently being developed. Active components are a lot more expensive than passive.

3.3 Technology weaknesses

One of the greatest challenges from a technology point of view is that RFID chips cannot be read except under certain conditions. For example, the the transponder is very susceptible to metal objects in its neighbourhood, since metal strongly reflects the electro-magnetic field of the read device. Water contact can also prevent communication, since the magnetic field is absorbed by water.

3.2

1.What is the function of section 3.2?

2.Note the verb tenses are being used in this section

3. What is the function of section 3.3?

Note the verb tenses being used

4. Data protection and privacy

With the increasing ability of computers to automate the collection of data, protection and privacy have become increasingly more important (1). Ideally every customer should be able to decide individually which data about them is saved by an organisation after a purchase is made (2). Unfortunately, however, data protection and privacy issues in RFID systems have been neglected so far (3). On some occasions, transponders have been used without the customers' awareness (4). For instance, the metro group has inserted a transponder into its new customer card but customers are only alerted to this in the 'fine print' (Alhazred, 2004) (5).

Furthermore, there is currently no means to effectively deactivate transponders (6). In some areas of applications the transponder can be destroyed using a simple microwave, but doing so is not advisable since there is a fire danger (7). In addition, a verification of the customer if the transponder is deactivated is mostly not possible (8).

5. Areas of application

RFID systems are becoming increasingly interesting to industry and governments(1). According to Quack (2006), 600 million RFID transponders were sold in 2005 and this number is expected to increase to 1.3 billion in 2006 (2). Based on a survey by IDTechEx, Das (2005) points out that the largest investments into this new technology come from the car and security industry, which are already using it intensively (3).

The following section will introduce a 'real life' example (4)

1.What is are the functions of sentence 1 - 5 in section 4?

Note the verb tenses are being used.

What are the functions of sentences 6-7?

Note the tenses being used

3. What is the purpose of sentences 1-4?

4. Note the tenses being used

5.1 German Passport

The German government has implemented security features for all passports issued after November 1st, 2005 (1). These features are realised in an RFID transponder which is embedded into the document (Ministry of Internal Affairs, 2006). (2) Until recently, only a picture of the passport holder and a security code was saved on the chip (3). However, having a capacity of 72 KB, it is designed to hold further biometrical characteristics, such as finger prints and iris scans in the near future (4). In addition to the large capacity, sophisticated security features are implemented (5).

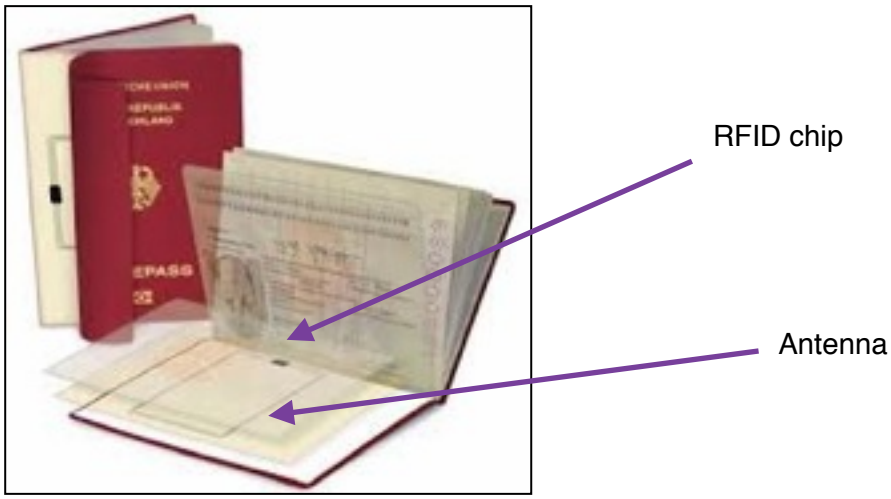

Figure 4. German Passport
Source: Bundesdruckerai, 2006

For instance, data communication between the reading device and the transponder is encrypted using a cryptographic coprocessor (6). Moreover, electronic signatures such as checksums prevent unauthorised modification (7).

1.What is the purpose of sentences

2. Note the tenses being used

3. What is the purpose of Figure 4?

4. What is the purpose of the source?

5. What is the purpose of sentences 6-7?

Note the tenses being used.

6. Conclusion

RFID is setting a new standard in automation (1). Since new features can be added to the chip, this technology is very well-prepared for future applications (2). In particular, branches of industries that rely strongly on logistics or specialise in automation, profit significantly from these new developments as they accelerate processes as well as decrease expenses (3). Furthermore, sophisticated security systems can be developed which will be interesting for security services as well as governments (4).

However, the number of critics and opponents is also increasing. Customer protection organisations in particular protest that the protection of personal data is disregarded (5). In fact, in some cases they have even been successful (6). As already stated the Metro group tried to introduce the new customer cards with RFID transponders in 2005; however, after receiving widespread protest, they removed the transponders (7).

It remains to be seen how this technology may be used in the future (8). Improvements to the major problem areas such as protection of personal data, as well as more transparency for consumers would contribute to a better image and acceptance on the market (9).

1. What is the function of section 6?

2. What are the functions of sentences 1-4?

3. Note the tenses being used

4. What is the function of sentences 5-7

5. Note the tenses being used

6. What is the function of sentences 8-9?

7. Note the tenses being used?