Delft Locust Devours Documents

Safe Document Destruction Services brought to the Desktop

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You can sometimes spot them in the streets in the Netherlands, the white lorries of the Van Gansewinkel waste disposal company. A while ago the company even had a radio commercial. To emphasize the company’s reliability, the message was read by Mr Wil Simon, who used to present the Dutch equivalent of the BBC Television’s Crime Watch. He warned the listener that without the professional attentions of Van Gansewinkel, confidential information could end up on the street, and possibly into the hands of third parties. «This morning, a blue plastic refuse bag was found along the A2 motorway near Amsterdam. In addition to some disposable coffee cups, the bag contained three folders with confidential files. Could the bag have come from your company?»

Members of Kube Design, a project team of students at the faculty of Industrial Design, looked into the problem and came up with a solution: have a «locust» on your desk. The idea has caught on and Van Gansewinkel has taken the design into production.

Confidential documents and sensitive information are used in many places, including banks, insurance companies, and government offices.

Law firms

Two years ago, the Van Gansewinkel company approached Ir. Henk Kuipers, a lecturer at the Industrial
Design faculty of the TU Delft, and asked him to design a new container for Destra Data, the part of the business that specialises in collecting and destroying confidential information. Van Gansewinkel issues each customer with a sealed container, called a Destra Box, into which they can put any confidential waste.

Kuipers: ‘The Destra Box is a customised grey plastic domestic waste container of 140, 240, or 500 litre capacity. Its design is totally unsuitable for office environments, particularly those of high-class banks, insurance companies, and law firms. The containers are cumbersome and ugly, which is why they are usually kept in an out-of-the-way place, mostly the basement, preferably close to an outside door so they can be easily collected when the lorry from Van Gansewinkel arrives to empty them. Our brief was to design an attractive new container that would fit in with the office environment.’

As part of the Design 6 course, Kuipers passed the brief on to Kube Ontwerp (Kube Design), a team of six Industrial Design students. Kube Ontwerp are Tine Leeuwerink, Tom Wagemakers, Wing-Ken Cheung, Bas Brederode, Masja Notenboom, and Frank Verbrugge. To quote from their report final report: ‘In our team we combine our individual specialities to look at product development from a fresh angle. We advocate a clear design method that tackles problems at the root: «Back to Basics». It helps us to reduce problems to simple terms and to create simple solutions.’

Kube Ontwerp’s final design report consists of three square volumes, which are barely thick enough to form a cube when stacked.

Grab barrier
The students started by making an extensive analysis of the service offered by Van Gansewinkel. The essence of this service is that a customer does not just dump his confidential documents in the bin with other waste. Instead, they are collected in the Destra Box somewhere in the office building. Through a letter-box slot, the documents are dropped into the sealed container, from which they cannot be retrieved, as the Destra Box is fitted with a grab barrier. This is the first link in the closed chain of destroying confidential wastepaper. The documents cannot escape when the Destra Box is emptied into the lorry, nor when the lorry is emptied at the destruction plant near the city of Breda. The members of Kube Ontwerp studied the entire process, and even rode shotgun on a lorry.

Bas Brederode: ‘At the plant, the lorries pass through a special gate into the unloading area near the shredder. The plant is surrounded by a high fence, there are security cameras all over the place, and all the employees have been carefully screened. The entire process is very well secured.’

On top of all this, to be absolutely certain, customers can witness the destruction of their data in a separate video room. Destra Data are the market leaders in the Netherlands, destroying some 45 thousand tons of confidential documents a year. Their customers are mainly banks and insurance companies. With the introduction of the Personal Data Protection Act, the

Although document shredders for office use are common, they are unsuitable for heavy-duty use, cannot handle large paper sizes or thicknesses, and do not take kindly to such things as plastic data carriers. Since the shredding of large volumes can also be very time-consuming, many businesses choose to delegate this task to specialist companies like Destra Data, a subsidiary of the Van Gansewinkel Group. The operation involves placing a large container fitted with a grab barrier in the basement or in a service area for office workers to empty their box of confidential documents into. The container forms the start of the controlled destruction process.

By appointment, a specially modified lorry comes by to empty the document containers. The transfer procedure has been specially designed to prevent anyone from getting their hands on the documents, with the container remaining locked until it reaches the top of the lorry.
amount of waste material that requires confidential handling has been steadily increasing. Although the data mainly comes in the form of paper documents, the quantity of digital data carriers such as diskettes and CD-ROMs is increasing. Van Gansewinkel spares no effort to convince their customers that they can be trusted to handle confidential documents, and to destroy them.

None of your business
Tom Wagemakers: ‘To gain insight into the problems involved, we asked a number of companies how they handled their confidential documents, and what problems they experienced in getting rid of them. We were trying to find out where there was room for improvement, both regarding security and ease of use.’ However, some customers were not prepared to accommodate them so easily. «None of your business» was the short reply they often received.

Wagemakers: ‘A number of companies consider even that information confidential, so they would not tell us how they handled the material. Perhaps in some cases our request made them realize that their policy in the matter was far from clear.’

Wing-Ken Cheung: ‘Some companies invited us to come round and see for ourselves how they handled matters, and gave us a complete tour of the organisation. On the other hand, there was one company with a rather dark entrance and a camera over the door. They had us outside in less than two minutes. Everything was hunky-dory, or so they said.’

Locust
Tine Leeuwerink: ‘The original idea was to redesign the Destra Box, i.e. the container that is emptied into the collection lorry. The problem is that no matter how nice you managed to make the container look, it will always be too big to fit into a normal office. So, the thing will have to be parked in a central location, and people will still have to carry their confidential documents over to it every now and then. And until they do so, the confidential wastepaper is kept in their offices, perhaps in full view on a desk. There were a number of people who had come up with a makeshift solution in the form of special trays to collect confidential waste material before taking it to the large Destra Box. But again, the documents remained in full view. Since the bottleneck clearly lies at the start of the chain, that is where we placed our solution.’

Kube Ontwerp named their design the Destra Locusta. Locusta is Italian for locust, and lying on its side the product does show some similarity to a locust, albeit a portly one. The curved metal frame in particular creates an illusion of a locust leg on either side of the plastic container. However, Van Gansewinkel was of the opinion that «Locusta» sounded too much like «Augusta», the Italian helicopter manufacturers recently involved in a corruption scandal in Belgium and other European countries, so it was decided to rename the Delft locust. Since the name «PaperSafe» was in use for an existing product, the new name became «Confi Box», with a direct reference to «confidential». In addition the name fits in much better with the existing

Destra Data B.V. became aware that the utilitarian look of the large document containers meant that they were often banished to basements or service areas. The company asked Kube, a design group of six students at the Industrial Design department, to look at the feasibility of redesigning the containers. One of the avenues explored was the effect of a different type of cover.
product line, which already featured a Destra Box and a Media Box. Even so, there could have been a problem. Were Van Gansewinkel aware of the fact that the Belgian company, Materne-Confilux, which specialises in fruit preserves, had been marketing a product under the very same name since 1996? Yes, they were, but since fruit preserves and document destruction were miles apart, this wasn’t considered much of a problem. Nevertheless, there might be a reason to change the product name once again to «DocuDeskSafe», or even «DocuDeathRow». Nobody is going to confuse either of those with jam.

Tension
On the table stands the first production model of the Confi Box. The rather conformist black colour of this example certainly wasn’t the idea of the students, who had suggested a rather more colourful look, ice blue for example. Bas Brederode: ‘Initially we gave the Locusta a semi-transparent front so you could see how much paper it had in its belly, and also to create a kind of tension with the product’s functionality in order to increase the user’s awareness of the confidential nature of the service.’ However, Van Gansewinkel was afraid that confidential information might be visible through the transparent casing. Fortunately, the colour need no longer be a problem, as customers will soon be able to order their Confi Boxes in any finish they like, including their own company colours. And from 2500 boxes upwards, the option will be free.

So what is this Confi Box or Locusta all about? The end report by Kube Ontwerp describes the essence of the idea thus: ‘Within the concept of Destra Data, we have found a gap between the point where the confidential waste is generated and the point at which the waste is collected. Confidential waste usually is generated in the office environment, from where the employees have to carry the waste to the nearest Destra Box. Each department usually has one box at its disposal. It is much more efficient to collect the waste in systems close to each desk.’ Brederode explains: ‘The Locusta brings the Destra Data service right up to your desk, with the added benefit of giving it a face of its own, in the form of a handy and good-looking box that also carries the name «Van Gansewinkel». We have designed the box so it can stand either horizontally or vertically on a desk. It can also be suspended over the side of the desk, so it does not take up desk space. In that position the paper slot is at the top and level with the desktop, making it easy to reach. Its curved shape brings in the centre of gravity to increase stability.’ Cheung: ‘You can even hang it from a desk with closed sides. The frame is fitted with rubber knobs to prevent it sliding away. The knobs provide enough friction to keep it from falling off, even if someone bumps into it. We also selected a special type of rubber that will not mark the desk surface the way rubber soles can do a shiny floor.’

Paper curve
So, the metal frame with the rubber knobs enables the Locusta to stand on top of desk in either of two positions, or to hang from the side. The frame also doubles as a grip when the Confi Box is carried over to the Destra Box, although in the production model there is slightly less finger space since the point at which the frame swivels has been moved about 5 cm. The curved shape of the box was certainly not a purely aesthetic decision. It looks good, but it also has a very important function. In addition to increasing the stability of the suspended box, the curvature also enhances the efficiency with which the sheets of paper are stacked inside the box. If the box were straight and upright, any sheets inside it would tend to fan out, which would make it difficult to add more paper. Just inside the slot, the Locusta has two ribbed «humps» that force a sheet of paper to curve across its width as it enters the box. Once past the humps, the paper straightens itself, and is neatly stacked along the lengthwise curve of the box. The humps also make sure a sheet of paper cannot escape out of the Locusta, as the curvature of the paper pushes its edges past the width of the slot.

Flap
Another problem was how to design the right kind of flap.
Wagemakers: ‘It goes without saying that the flap should allow the paper into the box and keep it there. But how do you make a flap that opens automatically using a key incorporated into the letter-box slot of the large container? Because of the way the container’s letter-box works, the flap has to open inwards, into the box, but at the moment the flap opens, the Locusta is held upright, with its contents pushing down on the inside of the flap.’

On the Destra Box, all that had to be modified was the letter-box slot (which measures about 30 by 5 cm), with a key on either side. As the Locusta is pushed into the slot, the keys open the flap, and the contents slide into the Destra Box. As the Locusta is pulled away from the letter-box slot, four springs push the flap shut.

Once the lock principle had been conceived, Bas Brederode made a working model using Lego, which was used to develop a whole range of variants in the weeks that followed. Van Gansewinkel changed the final design of the lock slightly to make it more difficult to open without a key. The test laboratory of the tno Organization for Applied Physics then put the flap and lock mechanism through its paces. Although the lock is very ingenious, the flap can be opened after some fiddling, as demonstrated by one of the students with the aid of a pair of biros, a pencil, and the back of a spoon.

‘It looks easy, but you need to know how the mechanism works,’ he says, ‘and even then it’s far from simple. You really need a second person to help you. Anyway, the trick might come in handy if the Locusta swallows your credit card by accident.
Leeuwerink puts the apparent lack of security in perspective.
‘Far from being a safety deposit box, the Locusta is more like a safe wastepaper bin. Since the Locusta is a

At the request of Destra Data B.V. minimal-investment solutions were also explored, including an external sleeve printed in the customer’s colours.

The analysis by Kube showed that there was little to be gained from redesigning the large container. The analysis also showed that the collection of the documents near desks gave problems, and that the security of the process had to be extended up to the individual workplace.

This required a desktop collection point that would be secure and offered a seamless connection to the existing concept, i. e. easy transfer to the container.
relatively small plastic container, it can be forced open, or even nicked altogether. As it is, the same applies to its larger cousin, the Destra Box. The Locusta is no more than a barrier between confidential documents and prying eyes. The documents are hidden from view and are no longer left lying about on a desk or in a wastepaper bin.'

Even so, looking for confidential information on a paper-strewn desk might be more of a challenge than spotting the Locusta, which fairly shouts «confidential documents» at you.

Leeuwerink: ‘Perhaps so, but even without the Locusta, people tend to put the papers they want to throw into the Destra Box to one side, perhaps in a cardboard box or a plastic basket. In a way, the documents are discarded without being properly disposed of in the large container. The Locusta offers a safe intermediate screen against nosey parkers.’

Wagemakers: The idea is that every employee gets a Locusta on his or her desk. Each will hold about 200 sheets of A4 paper, which is more than even «heavy users» produce in a day, so everyone can wait till the end of the working day before emptying the Locusta in the large container.’

The notion of what constitutes confidential waste and what doesn’t varies according to company. Most banks do not leave the choice to their employees. To them, any discarded paper is considered confidential.

Shredder
Instead of the Confi Box, each office could have a small document shredder to destroy confidential papers on the spot. Apart from the fact that shredders are noisy beasts that produce lots of dust, they cannot handle everything that comes their way. Bound documents, paperclips, staples, diskettes and CD-ROMs can spell death to an office shredder. Even the powerful shredders used by Van Gansewinkel find it hard to cope from time to time. Apparently, «confidential information» covers such a wide field that the Destra Box is used to dispose of such things as computer keyboards and solid lumps of metal. Anyway, simply shredding the documents may not be safe enough. In the nineteen-eighties, the Iranian secret service painstakingly pasted together shredded documents they had recovered from bin bags put out by the American embassy in Teheran.

Henk Kuipers adds another point: ‘Destra Data also operates in Belgium, where the law is that any confidential documents must be kept for at least two weeks before they can be destroyed. Just in case someone throws away something very important by accident. We don’t have this law in the Netherlands, but this system does offer the possibility of correcting such mistakes.’

Brederode: ‘Our final design is recorded in a series of sketches as well as in AutoCad computer drawings. We used the 3D-Studio MAX software to generate a 3D model that can be viewed from all sides. We also made a true size visual model in foam and plywood to demonstrate the design’s shape and the way it sits on the desk. Willem’s Prototyping, a model-making company in Delft, then produced a real working model in plastic.'
That would have taken us far too much time to do ourselves, but we supervised the entire process. Gluing together one-millimetre thick sheets of plastic, and getting the mechanism with the flap, springs, and lock to work is rather tricky. We opted for a box in several parts so it can be taken apart for repairs to the internal mechanism if necessary.

This is why the Locusta’s body is made up of two plastic shells screwed together with four special screws that require a screwdriver with a star-shaped head to remove them. Once the system reaches maturity, the body could be sealed to reduce production costs.

Injection mould
Teacher/supervisor Kuipers is highly satisfied with the final result: ‘Van Gansewinkel invested quite a bit in the development of the existing logistics system, so the new product had to fit into the current infrastructure. They certainly were not going to buy new lorries, or pay for extensive modifications to the existing lorries. Their customers in the Netherlands and Belgium have some 15,000 Destra Boxes in their offices, and Van Gansewinkel are not going to scrap those simply because we came up with a different scheme. The students have managed to bring Van Gansewinkel’s service a step closer, and increase both the level of protection and the ease of use. On top of that, it is a cheaper solution than adopting a new design for the large Destra Boxes. An injection mould for a new Destra Box easily comes to B 450,000 for the lower shell, and another B 225,000 for the top. This solution only required modifying the letter-box slot of the exiting containers to add the keys that open the Confi Box. The motto of Van Gansewinkel is «integrated waste disposal», meaning that they come in at the very point where something starts to be waste. In this case, the waste processing chain starts at the point where someone slides a sheet of paper into the Confi Box hanging from a desk.’

Leeuwerink: ‘I’m sure it’s also a great marketing tool. The Confi Box provides Van Gansewinkel with a very attractive product of their own. It’s visually appealing, and also a bit of gadget. People just might get sufficiently attached to it to step up the effort they put into the destruction of confidential documents. I think this puts them a leap ahead of the competition.’

Van Gansewinkel started production of the Confi Box. According to Diane van Dijk, key account manager for the Benelux countries, the new product will be officially introduced this month, so the first customers will soon have a Delft locust dangling from their desks.

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Other prerequisites for the box were easy handling and a grip for portability.

To make the box easier to carry to the basement, it could be made into a curve that would fit around the hip.

Kube looked at a number of workplace collection options to assess the collection system’s footprint and visual presence on the desktop.
Attached out of sight to the side of the desk was one of the options that was rejected.
Once it had become clear what the feasible options were, the first steps were taken towards working out the design.

A study of the functionality of a collection box that follows the crumpled form. The basic idea behind this was that the paper would pass a number of curves as it entered the box, to end up lying flat in the box in a natural way. The curves prevent the paper from returning the way it came, providing a simple means of retrieval prevention.
Several different basic concepts were developed for hanging and placing the collection box.

The initial sketches of the final concept, the Locusta, in different positions.

A foam model was used to test and modify the design’s properties.
Exploded view and various aspects of Locusta, created with the 3D-Studio MAX software. The mechanism to open the flap took a lot of work due to its complexity and the minimal space available.

Locusta has been officially renamed Confi Box to match the name of its larger cousin, the Destra Box.
The basis colour is black, but in large quantities the product can be supplied in other colours so it can match the company colour scheme.

To be able to use the Confi Box, the Destra Box had to undergo minor modifications to its interface. The loading flap was replaced with a cheaper type featuring integrated keys.