



LOGI **LM** MED

# Blood scanner

## Blood research within 45 minutes



*Investing in the future by working together for a sustainable and competitive region*



# 1 Executive summary

A recent study project at the university of Rhode Island in the United States of America developed a new chip under the name "lab-on-a-chip technology", that can research HIV, H1N1, Alzheimer, Hepatitis B and Malaria in about 45 minutes with only one drop of blood. At the same moment a university in California is also developing a similar chip to do research on most the same deceases. In the Netherlands there is also much attention on this subject. The university of Twente is already working on a variant of the chip that can test SOA's and sperm concentrations of the man.

In any case this concept is called as a new term: "lab-on-a-chip". This technology indicates a new technique based on a nano scale and strife's to making a fully mobile blood research facility.

At the moment the market provides different devices wherein the "lab-on-a-chip" technology is developed and applied. Currently there isn't a device yet that can test HIV, H1N1, Alzheimer, Hepatitis B or Malaria. This is technology is already developed in America, but not yet brought to the market as a complaint product. The goal of this project is to bring a product to the market with embedded "lab-on-a-chip" technology that can make civilians do their own research with minimal effort.

## 2 Project definition

The goal of the project is to develop a product wherein the "lab-on-a-chip" technology will be functioning at it's highest potential. This product will be called the blood scanner. The blood scanner will make civilians take a blood test through a single drop of blood and see if they have HIV, H1N1, Alzheimer, Hepatitis B or Malaria. It has been decided that the blood scanner will be placed in general practitioner practices. The reason of this positioning is due to the low cost and the possibility to do structural maintenance.

The first reason to place the blood scanner at practices of general practitioners is so the results will be directly inspected. The second reason is to give the civilians a feeling of security due to the practice's confidential nature. The third and last reason is that the costs are in between an acceptable limit. The costs will also be lower for civilians, because he or she doesn't have to buy any materials to execute the test. A chip, at the moment, costs around 3200 dollar. There is no clearance yet about the surcharge of the chip. When the chip is officially released and made available there can be negotiated about the prizing on greater batches.

## 3 Selection process and choices

As described earlier in the article there will be developed a product that will make it possible for civilians to test their blood with a single finger stick. In this section the products and services that are needed to develop the blood scanner are described.

The products that reside in the blood scanner are:

- The "lab-on-a-chip" key component

- ID-card- passport- and driver's license scanner to read personal data
- Login verification through DigiD (Dutch social identification) (through a computer)
- A computer system with a touch screen
- Needles
- Bio strips (to convert the blood into bio-data)
- Software

The service that will be developed will be made into a web application. This application will make profiles of the civilians that have taken one or more tests. These profiles will contain their details and the test result(s).

## 4 Final Product description

The blood scanner is the key component that acts a unique component in the development section that makes it possible for every civilian to test it's own blood. In the next section the front- and back view of the blood scanner is shown.



Figure 1

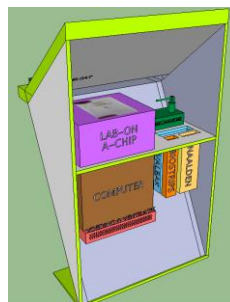


Figure 2

The blood scanner is composed of the following components:

- Key component "lab-on-a-chip"
- ID-card- passport- and driver's license scanner
- Computer components
- Bio strips
- Needles
- Touch screen
- Web application service

On the topside of the blood scanner there will be a touch screen. This touch screen will serve as a user-friendly interacting part of the blood scanner to guide the user through the testing process.

The first step that the civilian must undertake is ID verification. This will be done through the ID-card scanner and is compatible with ID-cards, passports and driver’s licenses. After the civilian identified it their personal details will be shown on the screen. The system will ask the civilian to verify if their details are still correct.

The second step the civilian must undertake is the login on the DigiD system. This is essential to verify if the carrier of the ID-card is really that same person and not an impersonator. There will also be a link to the health insurance companies while taking these tests. These companies can directly process the costs their customer has made (needles and bio strip) and handle the invoices. DigiD is an initiative of the Dutch government and is linked to the civilian their social security number. Each civilian in the Netherlands has access to this service (activated or not) and has an account in DigiD.

The third step will be the placement of the blood on the bio-strip. The mechanism on the inside of the blood scanner (figure 2) will transport the needle and bio strip in a chemical trashcan after the test.

After the civilian has pinched itself with the needle and has enough blood on its finger it can place it on the bio strip. The system will analyse the blood and generate a report. When the report is actually ready (test completed) the civilian will receive (after preference) a SMS or e-mail with a link to the service’s website to see the details of the report (test result). Before the civilian can see these results it has to log in into DigiD once more, because of security reasons.

## 5 Revenue

**Key partners:** Who are the key partners

**Core activities:** What are the core activities of the service

**Value proposition:** What is the proposition of the costumer; what advantage is offered

**Customer relation:** How is the product positioned compared to the suppliers, customers and competitors

**Customer segments:** On which target group will the company be focusing?

**Source of income:** How will money be earned with the service?

**Costs structure:** What costs come with the service

Key partners	Core activities	Value proposition	Customer relation	Customer segments
“Lab-on-a-	Supplying and maintaining the		Supplying maintenance of the	General practitioners Health insurance

chip” developers	blood scanners	See text below	blood scanners	
Medical instances	Maintaining the process data and payment process		Rent- or license proposals partially on a demand basis	
Health insurance	<b>Resources</b>		<b>Channels</b>	
Logius (DigiD, Ministry of Health)	“Lab-on-a-chip” Programmers Soft- and hardware blood scanner Servers		Telephone By mail/E-mail Internal magazine for general practitioners	
Approval agencies	DigiD ID-card, passport and driver’s license scanners			
<b>Costs structure</b> See text below		<b>Source of income</b> See text below		

**Table 1**

**Value proposition**

- The civilian will receive a result through one drop of blood in around 45 minutes. This result will report certain deceases that are present in the blood instead of a long process in a polyclinic
- The blood scanner will be placed without cost at the general practitioner practices. The general practitioner will sacrifice a little of it’s practice’s space and therefore receiving a part of the profit of the blood scanner
- The civilian can test it’s blood in secure and discrete environment

## 6 Communication

**Branch details**

Description: Production of medical devices  
 Range: Blood scanners and accessories  
 Branches: Health & ICT-branch

**Sources of information**

The sources of information for writing a plan are:

- Chamber of Commerce (KvK)
- Knowledge external advisors/teachers Hanze University
- Internet

## Target groups

The target groups of the blood scanner are a wide spectrum of customers. There is need of precise delineation of the "idea" of the blood scanner to give the market a clear meaning about the product. Also the positioning of the product has to be made clear and suited in the environments of these users.

### *Identity*

The first question that must be asked is; what is the identity of the target group.

The blood scanner and the co-existing test is initially meant for civilians who want to test themselves for either HIV, H1N1, Alzheimer, Hepatitis B or Malaria. In the future there will be looked for option to expand the test ranges to search for more deceases in their blood.

### *Goal*

It's of great importance that the target group can discretely identify itself in the publication of the possibility of the blood scanner. This is the main reason why it is important to keep the wishes of these civilians in mind. A simple and most anonymous approach of the customer is therefore essential.

### *Message*

Within the area wherein the target group is positioned it is crucial the necessity of testing the called deceases in as early as possible, which can be severe when detected and treated in a too late stadium. This method has to convince the target group to test themself to be sure when experiencing certain symptoms.

## Determining the price

The sales prices will be determined based on the costs that come with the blood scanner.

## Potential customers

The blood scanner will be placed in different general practitioner's practices through the Netherlands. The general practitioner will have to sacrifice a bit of space in its practice. The advantage of this approach is that the civilian will reside in an area where they feel safe. When the test results in a negative outcome the will be able to directly see the results. The costs of the tests are way less expensive than when a civilian has to buy a scanner for itself.

## SWOT analysis

### *Strengths:*

- Civilians will receive the test results between 30 and 60 minutes (efficient)
- Civilians can do the test in the trusted environment of their own general practitioner preventing long lasting hospital and/or lab visits (effective)
- Not every blood test has to be overlooked by the doctor due to a special score based evaluation if the test results were trustworthy enough. The civilians will be contacted when a test results positive

### *Weaknesses:*

- Because of the size of the project much specific knowledge from different areas is needed. Due to this point it is hard to coordinate all the different processes and their great difference in the time of milestones and deadlines

*Opportunity's:*

- DigiD and ministry of Health wants to cooperate
- Joint ventures with the universities
- Joint ventures hard- and software developers/companies
- Contracts with third parties

*Threats:*

- Miscommunication in the process of development between different parties
- The service can always contain errors that are overlooked in the development process. This can result in downtime, making the service temporarily unavailable
- Civilians do not have internet (this can be partially solved by calling with the receptionist, that can look up the report of the test, as it is also placed in the patient's dossier)

## **The marketing mix**

### **Product**

The goal of the product in the market is the accessibility, the discretion and safe way to let civilians test themselves if they have certain deceases. The blood scanner will be provided in format of a "booth", wherein a person can privately execute the test.

### **Place**

The blood scanners will be placed at general practitioner's practices. There will be need of storage facilities to store the cartridges of needles and bio strips. That's why it's a necessity to have a dedicated office place. From this location personnel can deliver the needles and bio strips.

### **Price**

There will be done extended research to see what is the best pricing for the needles and bio strips, blood scanners, web application and the DigiD service. The health insurance companies will also play a big role in this process, as they need to comply if this test will be included in the basic health package or only in extended packages.

### **Promotion**

Promotion of the service is not yet a visible point. The service needs to be realised first to see what options are best for promotion. For this process there will also be need of a research process.

### **Personnel**

The service will be realised by many different external third parties. This data can be read extendedly in the whole conceptual report.

Internally there will be need of personnel that can transports goods and install and repair the blood scanners.

## 7 Participants

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