



# **GlicOnLine** **([www.GlicOnLine.com.br](http://www.GlicOnLine.com.br))**

Ricardo Pessoa



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## Case Study – GlicOnLine (www.GlicOnLine.com.br)

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### OVERVIEW

GlicOnLine is a Java software that runs on mobile phones and internet access devices. The program allows diabetes patients to log blood sugar levels, count carbohydrates and calculate insulin doses in real time. The results are sent through the internet and diagnosed by physicians, helping their treatment and development. The company's mission is to improve the quality of life of patients with diabetes.

Clients have an online profile registered by their doctors and can at any given time, through a mobile phone application or logged online, determine their glycemic index and calculate nutrients intake. GlicOnLine provides customers with a list of over 600 types of food on simple (cup, spoon) measures. The program calculates carbohydrates and fat content and indicates back the amount of insulin that must be administered. Doctors can monitor their patients online through the internet and can change treatment parameters anytime. Any prescriptions changes are automatically replicated to the patient's mobile.

Dr. Karla Mello, one of the partners of GlicOnLine, is a specialist in Endocrinology and Metabolism, who has diabetes herself. In 1999 she developed a method that allowed her to dose her insulin shots during the day, according to her glycemic level, routine and diet, enabling a normal lifestyle. In 2001, her therapy was adopted by the Hospital das Clínicas- one of the largest public hospitals in São Paulo- as a way to treat diabetic patients. Her method has been also published in Medicine papers internationally (*refer to Annex I for list of publications.*)

In 2002, Dr. Mello's husband, engineer Floro Daria, created a software that allowed more rapid calculation of insulin dosage to reduce barriers to use such as difficulties in calculating proportions/insulin amounts. The information is entered electronically to allow simple calculation of insulin dosage.

GlicOnLine Limited was incorporated in 2004 and received funding from the São Paulo Research Foundation (FAPESP- Fundação de Amparo à Pesquisa do Estado de São Paulo) to incubate the business and develop the software in a biotechnology incubator. From 2004 to 2008 the company worked on developing the technology and ensuring the treatment was approved by medical institutions such as the Hospital das Clínicas, School of Medicine of the University of São Paulo (FMUSP- Faculdade de Medicina da Universidade de São Paulo), Association of Juvenile Diabetes (Associação de Diabetes Juvenil) and the Brazilian Society of Diabetes (Sociedade Brasileira de Diabetes). The system was also adapted for use in mobile phones.

In 2008 the software started to be marketed and the first strategic partners of the company were NovoNordisk and Abbott Labs (partnership expired in 2010). At present 1000 patients and

130 doctors are using the GlicOnLine system. The Company is currently trying to raise funds to improve their website and electronic platform so it covers more patients.

## MARKET FOR GLICONLINE

According to the Brazilian Diabetes Organization, 10 million people, or 5.6 percent of the population, have diabetes in Brazil<sup>1</sup>. Some specialists consider diabetes the epidemic of the century, affecting 246 million people worldwide. By 2025, it is estimated that 380 million people will have the disease.

GlicOnLine is still a very new product and it has not been heavily promoted. Most people do not know of this service. The company feels that there will be an increase in demand as it becomes better known and it estimates that approximately 75 percent of diabetic patients in Brazil still remain untreated.

The company faces funding challenges. It has mostly functioned with the private financing of the partners since it started to be developed. In 2004, the company received funding from FAPESP and was able to develop at the business incubator at the University of São Paulo (USP). In 2008, the company raised money with Abbott Labs and NovoNordisk to fund their operations after the grant from FAPESP expired.

As conceptualized, GlicOnLine is free for doctors and patients (except for conventional telephone costs to access the application). The product is financed by private insurance companies, who would benefit from a decrease of costs on diabetes complications, recurrent treatments, examinations or related diseases. The service could also serve as an instrument of insurance companies to track the development of their doctors' work. GlicOnLine also tried selling advertisement opportunities for insulin, needle and other medical equipment for pharmaceutical companies.

### Interview with Doctor Osmar Monte

Doctor Monte heard about Gliconline through medical publications and media. He has never worked directly with Dr. Karla Melo, one of the partners of the company.

Gliconline is the only product of its kind in Brazil. Dr. Monte believes that this technology would have a positive impact on patients' lives, since it makes calculating carbohydrates and insulin dosages easier. It also would help with tracking patients' developments.

Although he thinks the system is relatively simple and easy to use, a broader user base might not be reached in Brazil. Some obstacles for a widespread dissemination are:

1. Cost of the product for the user- lower income patients might not have access to mobiles.
2. Cost of adding technology to public hospitals. Gliconline requires that the doctors have computers to register and follow his patient's files.
3. Lack of training of doctors to be able to use technology.

Dr. Monte explained that Roche released in 2010 a new glucometer and distributed it in few clinics around São Paulo. Many endocrinologists were not able to use the equipment and required that Roche sent people to train them more than once.

The use of technology in diabetes treatment is very limited in Brazil according to the specialist. Today some patients make a glycemic count at home or in labs and send the results to their doctors via email. This practice again is very uncommon, due to the lack of access of doctors to computers in their offices and the time it takes for them to read and interpret the data.

Alternative therapies to GlicOnLine for diabetes patients Dr. Monte's opinion are:

Diabetes type 1

1. Use of Insulin Infusion Pump, which is expensive to buy and maintain.
2. The analog use of slow action insulin and ultra-rapid absorption insulin combined with the manual calculation of carbohydrates is the most common practice. (This is the practice where GlicOnLine offers support to)

Diabetes type 2

1. Use of medicines sensible to insuline action (Metformin or TZD) associated to inhibitors of DPP-4 or hypoglycemiants sulfa is the most common treatment methods.

He believes that if well marketed and accessible, diabetes initiatives in the Brazil would be very successful. There is a big market, he points out, comprising ten percent of the Brazilian population.

<sup>1</sup> "Calcule o número de diabeticos na sua cidade -Calculate the number of diabetics your city"  
<http://www.diabetes.org.br/para-o-publico/calculadoras/numero-de-diabeticos>

The solution is accessible to a wide range of the population, as long as they can afford mobile telephones or have internet access. This includes all but the bottom 20 percent of the population who earns the lowest income in the country.

Although there are other websites that count glycemic index and offer advice on controlling diabetes, there is not a competitor for GlicOnLine in Brazil according to Dr. Osmar Monte, a specialist in Diabetes<sup>2</sup>.

Mobile penetration Brazil						
	2005	2006	2007	2008	2009	2010
Mobile subscriptions (m)	89	102.3	123.6	152.4	176.4	193.9
Mobile subscriptions (per 100 people)	48.5	55.2	65.8	80.4	92.1	100.3
Sources: Pyramid Research; Economist Intelligence Unit; 2010. <a href="http://www.eiu.com">www.eiu.com</a>						

### Competitors

According to Mr. Ricardo Pessoa, the market is big enough for a variety of diabetes softwares. There are already various versions of diabetes programs/software for smartphones as well as conventional telephones. Competition would stimulate the creation of new features and services. The founders believe that GlicOnLine is not just a support software for diabetes patients but more as a telemedicine service for patients, helping them to connect instantly with their physicians.

In order to compete and maintain a bigger share of clients, the company would have to invest more in marketing, information and strategy. For that, their team would have to grow to offer development services, training and support.

**Similar Applications for Smartphones**

The applications below need more than a Java program to run on. GlicOnLine features some of the actions provided by the following programs, but on a conventional telephone.

**Glucose Buddy Diabetes helper:** Glucose Buddy is a data storage utility for people with diabetes. Users can manually enter glucose numbers, carbohydrate consumption, insulin dosage and activities. All data consolidated data on the patient is available online at [glucosebuddy.com](http://glucosebuddy.com). Application only available for systems running OS 3.0+.

**Track3 Diabetes Planner and Carb Counter:** Application logs nutrition, exercise, oral medication and insulin information. Application has carbohydrate and calorie details for over 80,000 foods.

**Diabetes Companion:** Application logs and tracks glucose and insulin levels and exercise routines. It features videos on cooking demonstrations, diabetes information and stories of people with diabetes. It has over 4,000 question and answers provided by diabetes professionals and 25,000 food recipes.

**WaveSense Diabetes Manager:** helps track glucose results, carbohydrate intake and insulin doses. Enter information in seconds, review the data with convenient charts and graphs and gain a new perspective on diabetes management. Results can be emailed to healthcare team.

**Blood Sugar Diabetes Control:** provides an easy way to record and keep track of all diabetic information needs. Glucose levels get charted automatically. The chart is divided by colors making it easy to track and understand. Program jots down food and medication intake and exercises. Screenshots of the graphs and information can be sent to the physician.

### OPERATING MODEL

#### Delivery architecture

GlicOnLine reaches out to each individual who has access to a telephone or internet at home. Access is also possible using public internet services like internet cafes. The application on the user's telephone is self-sufficient and will perform all the calculations without the need of telephone coverage. However the information will only be transferred back to the server once

<sup>2</sup> Dr. Osmar Monte graduated from the School of Medical Sciences of Santa Casa de São Paulo in 1971 and obtained his PhD in Clinic Medicine by the same institution in 1995. He is the chief doctor at the hospital Irmandade da Santa Casa de Misericórdia de São Paulo, adjunct professor and vice-director at the School of Medical Sciences of Santa Casa de São Paulo. Dr. Monte also treats patients in his private practice. He is a renowned specialist in endocrinology in Brazil.

connectivity is established. GlicOnLine works on a near-line application mode, that is, information is calculated and kept in the mobile telephone until telephone coverage is available and the server can be reached. This system guarantees that the information will be delivered to the server.

The company trains doctors to upload patients' information online. Doctors teach patients how to use the system using either a mobile phone or over the internet. All the information added by doctors online is immediately available at the company's website for insurance companies and other buyers.

The amount of insulin prescribed to each patient is also stored online creating a pool of data about the patient's development. Insurance companies can track client's data and the doctors' use of the software.

Additional technology and funding would enable the development of a GlicOnLine version for smartphones. Technology can also drive the cost of mobile plans and data sharing down, expanding the base of patients. Ultimately computer access should be universal.

## **Marketing**

GlicOnLine is a software based on Java, running on basic mobile telephones. However, Java was created to run one or few functions. It has often times computing constraints in telephones. Smartphones are equipments with more computer-like functions. They run Java programs, but also have the ability to run more advanced applications based on different platforms.

There is a growing market for programs and software that monitors and controls diabetes<sup>3</sup>. The applications on diabetes are easily available and do not run only on Java. They demand more sophisticated platforms. There are currently hundreds of applications available for smartphones (Iphone, Blackberry, Palm OS and Android) available internationally. Some applications are available for free download.

GlicOnLine has no direct competitors in Brazil and it does not have funds to deliver a wide marketing campaign. It has however gained visibility in the past year, when the company was featured on a TV program in Brazil on small entrepreneurs and technology. The company is currently working to improve the design of their webpage.

The company currently relies on the program developed and papers published by Dr. Mello on treating diabetes for marketing. They also own the authorial rights for the software by Mr. Dória.

## **Performance Tracking**

The company has as a goal to improve diabetics' lives. All patients who use GlicOnLine have been asked to complete a questionnaire (see Annex 2). Approximately 94 percent of patients have reported that the system represented an improvement in their lifestyle. The questionnaire also revealed that 68 percent of the patients feel healthier and have 84 percent more flexibility

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<sup>3</sup> Source: [www.diabetesnet.com](http://www.diabetesnet.com)

on their diet.

Each patient has their profile with their glycemic indices. These indices vary throughout the day, presenting peaks and lows. Once patients start treatment and controlling their sugar and insulin intakes, the width between peaks and lower levels tend to diminish. This progress is also shown on GlicOnLine.

<b>Patients Questionnaire after use of GlicOnLine</b>			
<i>Percentage of answers</i>			
	<b>Worsen</b>	<b>Same</b>	<b>Improved</b>
Time spent with diabetes	5.26	5.26	89.47
Time spent with medical visits	0	52.63	47.37
Treatment	0	5.26	94.74
Diet Flexibility	0	15.79	84.21
Difficulty interacting with family due to diabetes	0	41.11	57.89
Knowledge of diabetes	0	36.84	63.16
Performance at work/ school/ home	0	5.26	94.74
Life quality	0	5.26	94.74
Hypoglicemia	0	26.32	63.16
Feeling of being sick	0	31.58	68.42
Social limitations	0	31.58	68.42
Leisure	0	36.84	63.16
Concern about having children	0	57.89	42.63
Concern about traveling	0	31.58	68.42
Concern about diabetes complications	0	21.05	78.95
<b>Averages</b>	<b>0.35</b>	<b>26.95</b>	<b>71.97</b>

GlicOnLine lacks a specific department for compliance.

### **Governance structure and Leadership**

The company does not have a structured or traditional organogram, according to its management. GlicOnLine has four different areas: Marketing, Medical, Information Technology and Business/Strategy and seven employees. Five of these employees are partners.

When voting on a strategy, the decision vote is given to the manager of each different area:  
Marketing: Floro Dória is the responsible manager and will decide in case votes are tied in the area.

Medical: Karla Melo, MD, PhD has decision vote on medical matters.

IT: Carlos Alves (architect) and Adriano Petrich (scrum master- manager of software development and framework) share the decision power connected to technology.

Business, Partnerships and Strategy: Ricardo Pessoa retains the decision power for these issues.

### **Regulation**

The Conselho Regional de Medicina do Estado de São Paulo (CREMESP- Medicine Council of the

State of São Paulo) published a law on 07 August 2002 that regulates the existence of telemedicine. It requires that the providers of telemedicine services (individuals or companies) to be registered at CREMESP. It requires that in case of emergency a doctor should be available to prescribe support diagnostics and treatment. The responsibility of the service falls on the doctor that treats the patient and proportionally to the company providing the services. There are no further detailed regulations on prescriptions and doctor/patient relationships.

GlicOnLine did not face any legal barriers. Managers mentioned that the lack of specific regulations on telemedicine forced them to build scientific and institutional backgrounds. Since there were no regulations on providing these services, GlicOnLine developed a working framework anticipating future regulations.

According to Dr. Karla Melo, it was necessary to create – before it is prescribed by law - an electronic prescription from doctors to GlicOnLine users. This electronic prescription is what informs patients the suggested insulin dosage to cover their glycemic counts after meals. If the doctor is not registered with the company, he/she will not have access to the patient's electronic file. The electronic file contains the patient's information (weight, activities, lifestyle, age and all other data) that influences insulin dosages. Without electronic file of the patient, the doctor cannot prescribe insulin to the GlicOnLine user. In that case the user would be able to count carbohydrates and have the amount of food stored in the system, but no medication will be prescribed.

Patients could calculate the carbohydrates and determine the insulin dosage themselves, as it is commonly done, without the need of the registered doctor prescription in the system. But the responsibility would fall on the patient and there could be legal repercussions in case of emergency. GlicOnLine managers prefer to tie up the patient and doctor relationship and avoid conflict with future regulations.

If there were a law authorizing and making patients responsible for their insulin prescriptions, GlicOnLine managers believe they would have more clients using the system.

### **Financing Model**

GlicOnLine was incorporated in 2004 as a for-profit company. GlicOnLine has no connections to the government or other NGOs. The company is discussing with seed funds in Brazil and abroad to raise funds. The organization does not have, at the moment long term funding and are currently trying to raise finances for their current operations. The company is currently financed by the partners and sales of services.

In 2009, the company earned R\$ 135,000 (approximately US\$ 79,142). Tax is 13.33 percent over earnings and operation costs were around US\$2,000 including legal, accounting and nutritionist advisory. Hosting costs were US\$ 205 for servers that host up to 20,000 users.

Cost per user is proportional to the growth of the base of users. Costs of operations and support are expected to double for every 20,000 new users.

Sources of capital have been diverse: grant from FAPESP, strategic partnerships with Abbott Labs, NovoNordisk and founders' capital. The company holds no debt at the moment.



## **Business Models proposed by the company**

GlicOnLine has proposed three different business models to generate income over their services:

1. Sponsorship: GlicOnLine would receive a fixed monthly payment from sponsors and additional value according to the size of client base. The company structured sponsorship with Abbott and NovoNordisk until 2010, with the base payment of R\$ 60,000 (US\$ 36,000) per year. GlicOnLine is negotiating with Sanofi a new deal on those terms.
2. Corporate Services: GlicOnLine would serve as base to serve the diabetes community and associations. The company/association would have access to patients' data and evolution at a cost of R\$ 2.5 (US\$1.5) per user/per month.
3. Technology Licensing: Income is generated through royalties per unit distributed. GlicOnLine would act as the Original Equipment Manufacturer (OEM) or operational system to the smartphone/telephone manufacturers and/or network service providers.

Management is exploring the three models, with more success so far on sponsorship deals. They conceptualized a sponsorship model defining different stakeholder groups (among pharmaceutical and diabetes related industries: syringes, laboratories, electronic equipments, glycemic measurers etc.) GlicOnLine wanted to select one company as a stakeholder in each different segment, giving them exclusivity. At the moment, GlicOnLine has not developed any concrete partnership with any pharmaceutical company.

All costs have been limited by the revenue of the company and kept to the minimum to cover only operational expenses. To cover additional expenses, the company has established collaborative partnerships. For example, for public relations, GlicOnLine has partnered with Bee Comunicações. The PR firm has joined the project taking considerable risk, depending on the growth of future income for their remuneration.

## **Barriers to Entering the Market**

According to GlicOnLine managers, one of the biggest barriers to their product has been the traditional treatment of diabetes. Offering a service that changes practices that have been applied for many years, demands adaptation of patients and doctors.

GlicOnLine represents an innovation in Brazil in medical, technological, information technology and business terms. GlicOnLine medical treatment proposed the counting of carbohydrates before meals, instead of eating specific and predetermined food. It innovated by introducing in the market the telemedicine concept, by using telephone technology to reach out a wide range of individuals. In terms of business innovation, Mr. Ricardo Pessoa, explains that their model was created to be financed by a third party and not the doctor or the patient.

The lack of competitors also represents an obstacle, according to Mr. Pessoa. He explains that their product could be better marketed if clients would know of different alternatives for diabetes.

Finally, the most important obstacle for GlicOnLine has been funding. Since the development of

the software, funding has been limited and directly dependent on personal financing. Mr. Pessoa pointed out that the scaling process of the product has taken longer than expected.

### **Alternative use for GlicOnLine technology**

GlicOnLine established in Brazil a telemedicine framework and could be used to control other chronic diseases and general nutritional habits.

The company's strategy has been to focus in a specific sector (diabetes and insulin dependent patients) and leverage out their medical expertise in the practice.

## **APPENDIX 1**

### **Publications by Dr. Melo**

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