

International Economic Conference of Sibiu 2013 Post Crisis Economy: Challenges and Opportunities, IECS 2013

## An Analysis of the Romanian Internet Banking Market from the Perspective of Cloud Computing Services

Lucian Alexandru Frățilă<sup>b\*</sup>, Răzvan Daniel Zota<sup>a</sup>, Radu Constantinescu<sup>a</sup>

<sup>a</sup>Faculty of Cybernetics, Statistics and Economic Informatics, Department of Economic Informatics and Cybernetics, Bucharest University of Economic Studies, Bucharest, Romania

<sup>b</sup>Doctoral School of Economic Informatics, Bucharest University of Economic Studies, Bucharest, Romania

<sup>a</sup>Faculty of Cybernetics, Statistics and Economic Informatics, Department of Economic Informatics and Cybernetics, <sup>a</sup>Bucharest University of Economic Studies, Bucharest, Romania

---

### Abstract

The Internet banking today is not something new anymore; all the banks in the Romanian market (and not only) are offering different forms of Internet banking which is ultimately a service in the cloud. In terms of cloud computing, Internet banking represents SaaS for the users, an application which uses Internet for making payments, viewing information, making deposits and so on. In this paper we briefly analyse the Romanian Internet banking market and compare some of the most popular Internet banking platforms. We will also draw some conclusions about this market in the context of the new Cloud computing delivery models.

© 2013 The Authors. Published by Elsevier B.V. Open access under [CC BY-NC-ND license](https://creativecommons.org/licenses/by-nc-nd/4.0/).

Selection and peer-review under responsibility of Faculty of Economic Sciences, Lucian Blaga University of Sibiu.

*Keywords:* internet banking, electronic banking, online banking, mobile banking, cloud computing.

---

---

\* Corresponding author.

E-mail address: [alexandru.fratila@csie.ase.ro](mailto:alexandru.fratila@csie.ase.ro), [zota@ase.ro](mailto:zota@ase.ro), [radu.constantinescu@ie.ase.ro](mailto:radu.constantinescu@ie.ase.ro)

## 1. Introduction

As a very concise definition, Internet banking allows customers to make payments over the Internet, by logging to a secure website. This paper aims to analyse the current status of the Romanian Internet (or Electronic) Banking market, evaluate a number of platforms and emphasize the need of Cloud-based mobile banking solutions based on some identified benefits.

According to dictionary.com (Dictionary.com, 2013), electronic banking is defined as conducting banking transactions through computerized systems, as electronic funds transfer by automated-teller machines, intended to speed operations, reduce costs, etc. According to Cambridge Dictionaries Online (Dictionary.cambridge.org, 2013), electronic banking represents the use of the Internet to organize, examine, and make changes to your bank accounts and investments, etc. electronically, or the use of the Internet by banks to operate accounts and services. From the same Cambridge Dictionary we may find out that Internet banking (IB) is the system that allows you to put in or take out money from a bank account by using the Internet.

As we can observe from the two definitions of electronic banking above there is a slight difference in the understanding of the term, the more recent definition from Cambridge is defining the current understanding of the electronic service. However, we are not getting into the deep economic details with these services; the main purpose of this paper is to set the correct understanding of the term.

Eurostat states that in Romania, in 2012 only 3% of the Internet users were using Internet Banking. The fact that only 46% from the total population questioned (Source: National Statistical Institute - Romania via Eurostat) had used the Internet in the last three months denotes a serious issue with the electronic banking services. Also, the decrease from 4% in 2011 to 3% in 2012, suggest that our current market is not attractive for consumers. The graph below shows that the general trend is an increase in electronic banking usage. We are not going to get into deeper detail of this data. The statistical data has the purpose to give an introductory overview of the Romanian market.

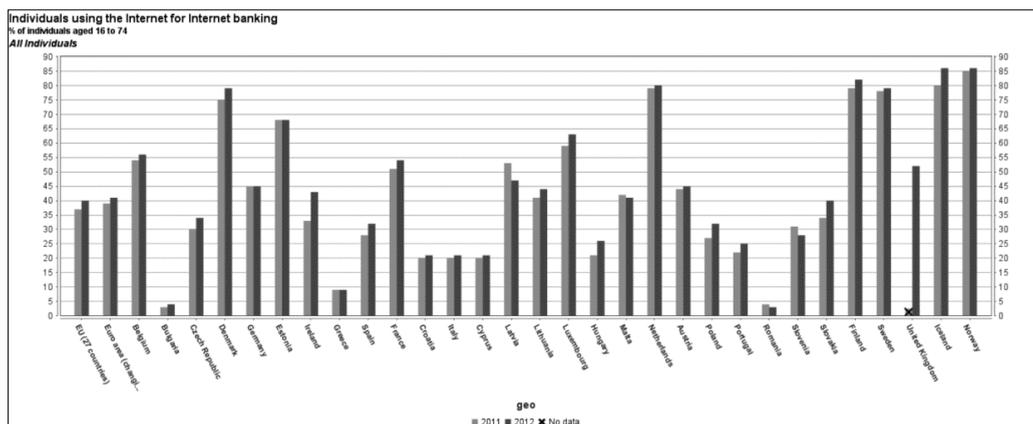


Fig. 1. Individuals using the Internet for Internet banking (% of individuals aged 16 to 74; Legend: ■ 2011, ■ 2012) Source: Eurostat, <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tin00099>

Considering the results from Eurostat we acknowledge why certain market analysts and researchers state that Romanian banks have implemented electronic banking systems for the sole purpose of marketing (Rădulescu, 2009). Electronic banking has to abide to the same regulations as classic banking like Basel II and PCI/DSS so the electronic systems are "smaller banks" that function within a classical banking system (like a bank in a bank). Internet banking therefore requires exclusive infrastructure from core banking to delivery of the service. This makes the implementation complex and expensive rendering banks, in the current economic climate, to charge enormous amounts money for the service or to limit the functionalities therefore limiting the compliance requirements and the costs.

## 2. Internet Banking platform analysis

In the present paper we have analysed the Internet banking platforms from ING Home Bank, BRD, CitiBank and BCR. We have analysed the platforms from the functional, performance, security and business perspective (economical) considering the limitations of the publicly available information.

We had no best practice around IB platforms evaluation but common sense criteria around PCI and Basel compliance. We have used a survey among users of the above platforms to decide what metrics to use in our study, selecting 4 criteria from a number of 32 criteria used in the Mobile Banking Evaluation Framework - MoBEF (Zarifopoulos, 2009).

MoBEF consists of six categories of criteria: 1) Interface, 2) Navigation, 3) Content, 4) Services Offered, 5) Reliability, and 6) Technical Aspects. We have not evaluated 1 and 2 categories of criteria even though some might impact performance or usability from the user perspective as we have assumed the platforms have passed a basic QA test.

For the performance part we have been using the platform offered by Blazemeter ([www.blazemeter.com](http://www.blazemeter.com)) which is based on Apache JMeter. The test was done using a cloud platform because of the resource need and the fact that Blazemeter offers the best practice.

We have listed the metrics evaluated for each platform in Table 1 below with ratings 1 to 10 where 10 is the best and 1 the worst. Grading has been done by counting the features defined in the MoBEF framework.

Table 1: Platform evaluated

Bank	Service	Content	Services offered	Reliability	Technical aspects
ING	Home Bank - internet banking	9	9	9	8
BRD	BRD-NET	4	4	9	8
CitiBank	Citibank Online	4	4	9	8
BCR	24banking	9	9	9	8

Source: Bank web applications

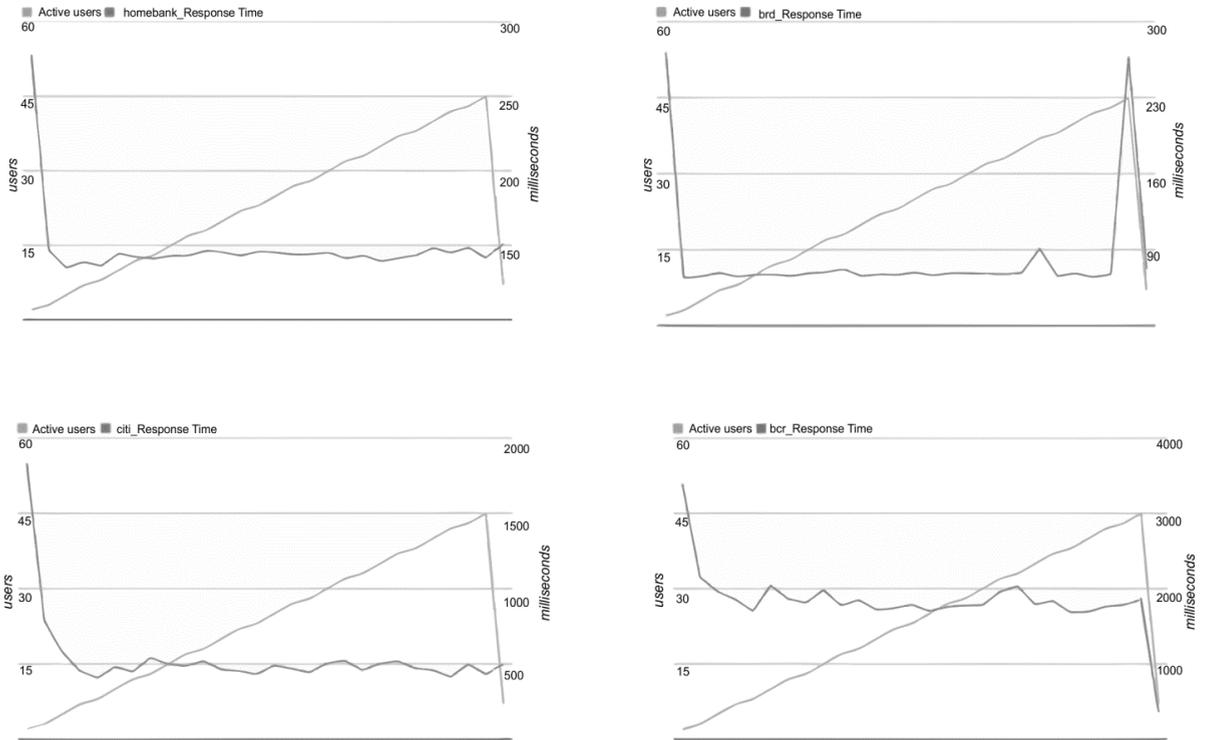


Fig. 2. Gaphical comparison of response times  
Source: blazemeter.com

### 3. Conclusions

We note from the studies and the analysis mentioned before that the Electronic Banking needs to be reengineered in order to make it a viable service and trustful service. This means that the business model, the functional, the security and the performance aspects of electronic banking platforms must be reconsidered.

As Accenture observed in their study "New Era Banking", banks have to transform their business model, product offerings and core banking operations in order to meet the customer needs in a competitive, efficient and sustainable fashion (Accenture, 2012).

From our test perspective it's needless to say that the systems need a more flexible customer oriented interface that can adapt quickly to market needs, regulations, security characteristics and extreme usage demands. These observations lead us to the conclusion that the solution for enabling more flexible organizations in handling customers' demand is Cloud Computing.

As banks adapt to these changes in their competitive and technology environments, cloud computing will play a major role. Cloud's combination of low cost and high scalability, effectively unlimited processing power and storage, unprecedented agility and speed to market, and variable pay-per-use cost structures, all support the quality that banks will need to compete and win in the future.

The trends in this area according to Accenture are:

- Cloud-based financial services offerings will leverage social and mobile media to transform the banking experience and relationship for customers;
- Single-tenant private clouds —through virtualization—will play a pivotal role in core banking, enabling banks to keep control over the location of sensitive customer data. Over time, hybrid clouds and public sovereign clouds will enter this domain;

- Public cloud and cloud-based shared services will dominate non-core and non-differentiated banking activities, from workforce collaboration to document management and even payments (Accenture, 2012).

In simple terms, Cloud computing, with its characteristics, will improve:

- The elasticity of the service - infrastructure will scale so that the user will experience uniform response times no matter how high the demand will be;
- The security of the service - this means that after carefully reviewing the laws and regulations, banks would even be able to benefit from the cloud from the security perspective. Cloud Service Providers should have all the security infrastructure in place and comply already with most of the security standards around because of the laws, regulation and multi-tenancy constraints;
- The service costs of the banks - offering a cost effective solution from all perspectives. Banks will no more have to do capital investments in large data centres to be able to provide a service. Banks will be able to use only the capacity needed on a pay-per-use model.

We have seen multiple cases of Cloud migrations of banking services around the world, especially in new companies or new markets.

For example, banks including Metro Bank in the UK or Sofol Tepeyac in Mexico are using Temenos’ T24, the first production-grade core banking system that runs in the cloud. Some leading US banks are using the Varolii cloud-based voice dialer (Varolii, 2013).

IBM announces that a Leading Pakistan Mobile Banking Provider Uses IBM Cloud to Expand Delivery of Secure Financial Services on Mobile Phones - Monet Adopts IBM Private Cloud Infrastructure To Meet Strong Customer Demand for Mobile Banking Across Pakistan. (IBM 2012)

Citigroup has implemented various social media strategies to communicate better with its customers, including a blog that actively seeks questions and comments from customers, a YouTube channel, and a service that will allow customers to talk to bank staff through Twitter or other social media. Bank of America uses Twitter as a customer service and advice tool, and reports that customers find it a faster and more effective way of getting the help they need than traditional customer service channels (Accenture, 2012).

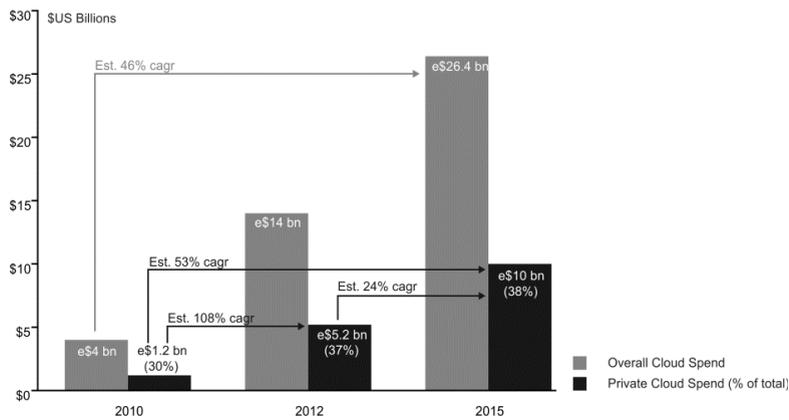


Fig. 3. Estimated spending on private cloud by financial services companies worldwide

Source: The Tower Group: “Destination 2015 – Spending on Cloud Computing in FS.” By FS Senior Research Director Rodney Nelsestuen, June 2011. Note: Spending estimates based on assumption of no clear global cloud standards

In the banking industry data privacy and regulations might be a concern to banks. Some regulations might even restrict banks to hold customer data on their own private infrastructure. This will influence the cloud implementations as it can be noted in the Figure 3 above. Banks in more mature markets will most probably have private or hybrid delivery models to contain private or confidential data in their own infrastructure. New banks, the ones operating in newer markets or where the regulations allow it might fully benefit from public clouds.

**Advantages of Private Cloud:**

- Reduces software licensing costs by centralizing across enterprise;
  - Efficient use of hardware and network assets via a virtualized model that serves to reduce expansion of IT footprint;
  - Can better absorb explosion of data without increasing hardware investments;
  - Ability to add discrete services under a hybrid model;
  - Offers better management control to both business and IT executives.
- (Accenture, 2012)

**Advantages of Public Cloud:**

- Zero or almost zero investment;
- Offers highest flexibility of service;
- Lowers time to market of new services;
- Lowers operational cost;
- Can improve security of services.

Cloud Service Providers (CSP) can be as safe as with any other option on the market but can offer better scalability, time to market, cost reduction or security. Banks that want to implement a public or a hybrid cloud solution would have to perform maturity assessments on the CSPs or take a standardized approach like implementing a governance or enterprise framework with the cloud.

**References**

- BCR Internet Banking (2013), <http://www.bcr.ro/ro/persoane-fizice/operatiuni-bancare/24-banking/click24-banking?clid=CK-W383nn7YCFUnwzAod0mkAog>
- BRD site (2013), <https://www.brdooffice.ro/smartoffice/index.html>
- Citibank Internet Banking (2013), [http://www.citibank.ro/NOUL\\_citi/internet\\_banking\\_ro.htm](http://www.citibank.ro/NOUL_citi/internet_banking_ro.htm)
- Dictionary.com site (2013), <http://dictionary.reference.com/browse/electronic%20banking?&o=100074&s=t>
- Dictionary.cambridge.org, (2013), <http://dictionary.cambridge.org/dictionary/british/electronic-banking?q=electronic+banking>
- IBM news room (2012), Article available at: <http://www-03.ibm.com/press/us/en/pressrelease/39290.wss>
- ING Internet Banking (2013), <http://www.ing.ro/ing/ro/Home-Bank-Internet-Banking.html>
- Online banking (2013), <http://www.bendigobank.com.au/personal/e-banking.asp>
- Rădulescu, M., Șerbănescu, L. (2009) Development of the electronic banking services in Romania; *Communications of the IBIMA*, ISSN: 1943-7765
- Sardet, E., Viale E. (2012) A new era in banking - Cloud computing changes the game, Availabl at [accenture.com/cloudstrategy](http://accenture.com/cloudstrategy)
- Varolii site (2013), <http://www.varolii.com/Solutions/Financial-Services/Overview.aspx>
- Zarifopoulos, M., Economides, A. A. (2009). Evaluating mobile banking portals. *International Journal of Mobile Communications*. Vol. 7, No. 1, pp. 66-90. Inderscience, ISSN (Online): 1741-5217