

COMPANY PAPERS

January 2013

edition no. 10

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Foreword

Key Concept: Fine-Tuning

The fresh streams of 2013 carry both the challenges of the unknown and the experience of the seasoned explorers. Codespring and its partners are heading towards new projects bearing in mind that the right combination of resources and processes may be the key to success. It is all about **fine-tuning**.

Our *Market Report* on the latest changes of Cluj-Napoca software development market – a living proof of the power the fine-tuning concept has - will feed you with concrete examples on how business partners succeed to meet objectives and positive outcome. Next, the *Industry Insights* chapter reveals the story behind the scenes of banking software and how Codespring overpassed some project challenges. On this special edition, we also had the honour of interviewing a living leadership role model in the ITC field, Mr. Christoph Horstmann. In the end, our traditional thinking point discusses the dilemma of standardization of the embedded systems.

Enjoy reading and keep in mind that all responsibilities, processes, teams and infrastructure elements may be adjusted according to the parties' mutual agreement. Fine-tuning is about continuous improvement and the search for highest performance.

Codespring Team.

Market Report

Cluj-Napoca, Transylvania: the Heart of Romanian Software Development

Currently the 2nd largest city of Romania, Cluj-Napoca is constantly climbing rankings in the ITC field, namely for its software development activity. Hosting near 250 ITC companies, with roughly 5000 active software engineers, Cluj-Napoca's software market has expanded by 48.8% in the last two years. Bearing innovation and growth in mind, 2012 culminated with the setup of the Cluj IT Innovation Cluster.

Based on our latest data, 2013 opens the door for new collaborations forms, new projects and new strategies.

New Cluj ITC Structure

Formerly known as the 1st hardware center in Romania, Cluj-Napoca went through massive changes during 2012. The disinvestment strategies of a gigantic Telecom Corporation and the latter general economic landscape meant a 40% decrease of total

market value, but also let software development win market shares. Today, software development holds 18% of the total local market expressed in net revenues, against 6% recorded in 2009.

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2011 Cluj-Napoca IT&C Market Structure

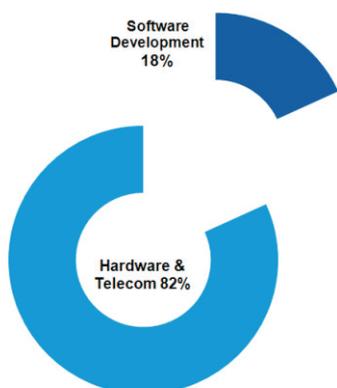


Figure 1: 2011 Cluj-Napoca ITC structure; source: own calculation based on 2011 Cluj Finance Administration Data

Despite the market contraction from a total value of EURO 1.09 billion in 2011 to an estimated value of 0.6 billion in 2012, the software development sector registered considerable growth.

New investments from both domestic and Fortune 500 international companies have been registered in 2012. Along with the new settlements, the strategic outlook for Cluj-Napoca has been clarified. The city is ought to be the next Silicon Valley of Romania in direct connection with the biggest ITC markets in Europe and worldwide.

Positive Evolution of Cluj Software Sector

As data reveals, software development companies in Cluj-Napoca are doing well. Both net turnovers and profit margins exceeded expectations.

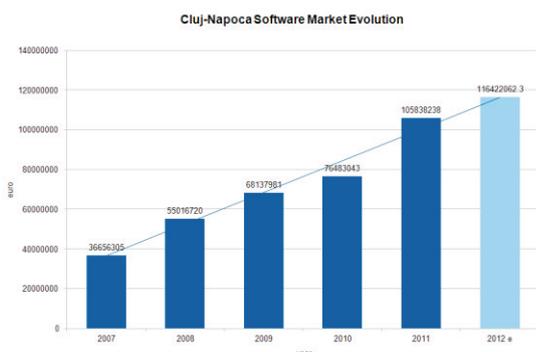


Figure 2 : Cluj-Napoca Software Market Evolution in Total Turnover (2007-2012e); source: own calculation based on 2011 Cluj Finance Administration Data

For 2011 we recorded a total growth of 38.8% of total net turnovers while we estimated a cautious year-on-year growth of 10% for 2012. The average profit margin during 2010-2011 was of 10.5% from the total net turnover.

Due to the recent foundation of the Cluj IT Innovation Cluster, this positive trend is expected to continue and radically reshape the local landscape.

Top Business Partners

A key growth factor for Cluj-Napoca is the set of selected partners that the business community attracts year by year. Due to a specific mix of cultural traits, diverse ethnical presence (Romanian, Hungarian and German) and elite academic institutions, the city has become a preferred destination for outsourcing and offshoring.

Germany is #1 Partner and Investor in the software development sector of Cluj-Napoca. "Cultural proximity, language skills, working ethics and well established socio-economical leverages with the German business community are the foundation for the good cooperation." declares Mr. Levente Szélyes – CEO, Codespring and he continues: "On top of that, Germany is Europe's #1 ITC market and informally nominated Europe's Silicon Valley having diverse industries and a cultural attitude towards performance and diligence". The search for reliable partners and creative talent make Cluj-Napoca a healthy choice.

Rank	Business Partners by Country of Origin
1	Germany
2	United Kingdom
3	USA
4	Netherlands
5	Finland

Figure 3: Top 5 Business Partner Countries for Cluj Software Development Companies

United Kingdom is the second largest ITC partner for Cluj-Napoca, closely followed by USA investors and customers. Netherlands partners have also a noticeable presence and have consistently promoted the idea of continuing strategic partnerships with Cluj software professionals. Finland and fellow Scandinavian countries put their mark on the city's ITC progress.



Growing ITC Talent Pool

The privilege of hosting 11 Universities in Cluj-Napoca, delivers about 1000 ITC graduates per year. In partnership with the corporate community, many R&D projects are being conducted. The mind-set for innovation and personal contribution to assigned projects is being shaped since the early stages of the profession.

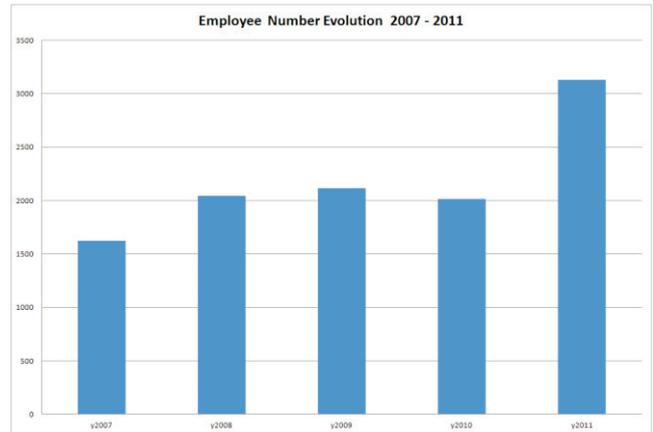


Figure 4 : Employee Number Evolution for the Software Development sector in Cluj-Napoca; source: own calculation based on 2011 Cluj Finance Administration Data

As one can observe on the table above, companies hired more in 2011 compared to the years before. The same trend was noticed in 2012. Part of the 55% growth recorded on the software employment market of Cluj-Napoca in 2011, is due to the changes of the work regulation. Today fewer professionals are working as independent authorized practitioners, but the option is still a good choice.

Sourcing Strategies for 2013

In 2012, Romania has reached pole position in Deloitte's CEE Technology Top 50. In the same time, Jones Lang LaSalle allowed the 9th rank in the Top 10 Outsourcing Destinations Globally. The key driver proves to be the added value that most Romanian providers manage to bring on the table.

Recent deals and agreements strive to fine-tune resources, costs and expected business impact in order to reach the best results. Whether we speak about staff augmentation, consulting, managed services, cloud-based outsourcing, offshoring or partial outsourcing, Cluj-Napoca ITC community constantly readapts to evolving needs.

We estimate that 2013 will be a year of growth, profit restoration and redefinition of Cluj-Napoca's strategic posture on the ITC map. (D.C.)

Industry Insights

Challenges of working on software that moves money

The banking industry is a market shaker of the economy that aims to react to customer demands in the shortest time possible. Cost and time are the key factors financial institutions are considering when they are turning to software solutions. These, in fact, are not enough to develop competitive advantage. Security of the financial transactions is the high stake challenge that needs to be addressed jointly by the software development service provider and the IT department of the bank.

Challenges of developing financial software

Robust application. Banking software is characterized by high complexity. Compound code components, extensive specification files and communication between legacy code and newly created software are making the difference in this sector.

CASE STUDY

Our Client is:

German market-leading provider of tailored software solutions for banks, corporates and service providers, developing secure high-end software systems for financial transactions.

The Challenge facing us was in:

Software development, software testing and support of the client's existing software .

Actions we took to address these challenges:

-Implementation of a CAMT XML message import and integration of this into the existing product with support of the old MT 94x messages.

-Provide an alternative login solution in case of USB smartcard reader failure.

Used Technologies:

Java, Oracle Database, XML SAX, Spring, JMS, WebSphere MQ, Struts, WebService, JSF.

Used Development Tools:

Maven, Sonar, Hudson, JIRA, Jboss4, WebSphere 6.1.

Our Actions Resulted in:

-The existing product of the client complies with ISO 20022 CAMT XML message standard that replaces the old MT 94x messages;

-CAMT import implementation satisfies the requirements of configurability, extendibility and high performance.

-“Zero footprint” solution to access the banking application: it enables authentication and signature by using the same combination of reader and smartcard. No need to physically connect the reader to the PC and to install software.

Add to this that quite a few number of solutions have been developed independently and are subject to later integration. There is also the chance that these software solutions have been created by different service providers over the last 50 or so years. Copy-paste option is forbidden, IDs, codes need to be retyped manually from one screen to another.

The human resources component. Business served by the robust financial software applications is so vast that there is not a single person in the bank to understand it all and to have an overall perspective on it. In fact, subject matter experts rely on existing software completely the other way around: they use the existing software to understand and manage underlying processes of financial transactions.

Actually the existing software suspended the need for the business logic knowledge. Therefore, software developers need to consult with every subject matter expert in part to put the system architecture together to enable add-on functionality integration.

Ensuring security. As transactions are being executed from some remote location and financial information is transmitted over wireless network ensuring safety of application data is mandatory. Devices assisting such transactions are subject to authentication and financial applications must safeguard that unauthorized devices are not connected to perform money transactions. Furthermore, a secure transaction cannot happen without authentication of the user ID & password of the bank's customer.

Also, back-end that verifies data integrity of the system should be a high priority concern: no one should be granted access to the system to alter the database. It needs to detect, recognize and avert fraud attempts, delay suspicious transfers and send notifications to a user through a third channel (e-mail, call, sms) every time a transfer is made – to mention only a few concerns of the security aspect.

Technology solutions. As consumers choose more often mobile banking, supporting the same application on multiple and different mobile device platforms can be a real challenge. Full mobile application development lifecycle for multiple platforms is due to cover mobile payments, transfers, localization of nearest ATM, mobile remote check deposits or payment due reminders.



Provocations of testing a banking software

A few questions you might consider when testing the interface of a financial software:

- Is GUI interface documented?
- Is there an assumption that the user will always use keyboard and mouse?
- How will it function on tablets and smartphones?
- Can the user download documents, if so, in which format?
- Are any connections established on the application server's side (stock exchange applications)?

Managing the cost of mobile banking application testing for diverse device models is an important factor. Identifying test case failures on the actual devices is essential as all current data is pointing to a surge in mobile banking.

Nevertheless, introduction of automated testing tools enables testing on various mobile OS platforms and devices without having to procure the physical hardware. Instead of device procurement costs, looking after chargers and USB connection cables, ensuring appropriate development environment with drivers and sync of software and headaches caused by compatibility issues with drivers of various mobile devices, the single concern and focus point is the action of testing.

A View from the Top: Interview with Fritz-Christoph Horstmann

In early November 2012 Codespring benefited again from the professional guidance of Mr. Fritz – Christoph Horstmann, an entrepreneur and voluntary senior consultant, under the framework of a collaboration with the Senior Experten Service (SES), a non-profit organization of the German



industry for international cooperation. We were delighted to hear about the experiences of a seasoned leader and would like to share with you some key thoughts and lessons of a remarkable player within the international ITC community.

Fritz-Christoph Horstmann is a long term entrepreneur and shareholder in various companies, a voluntary senior consultant at SES, and former

member of the board of the Semiconductor Division of Siemens AG. With consistent track record of leading innovative companies and coordinating sales, marketing, and M&A activities, he has gained inspiring business experience occupying general and interim management, executive and nonexecutive director and consultancy positions at German and European companies active in the high-tech, media, and services industries.

We would like to address once again special thanks for Mr. Horstmann for his time, professional advice, and insightful comments. In today's Silicon Valley driven technology world it is a pleasure to have the opportunity to learn personally from long-time professionals.

1. As an advisory board member, what is the best thing about being an adviser?

I have served as a nonexecutive director on various company boards for more than thirty years now. Quite frankly, in some cases the aim was just to safeguard my own investments. However, it has always proved rewarding working with bright executive boards on solving a company's most pressing issues. As a non executive you are free to advise, teach, and learn (!) without the burden of running the daily business, but you are deeply concerned with the success of the company anyway.

2. Why volunteering? Why SES?

When you ask why doing professional work voluntarily and why with SES, the one was prerequisite for the other. After more than thirty successful years in the ICT and Media industry I believe I owe society some return. To spend, let us say, a quarter or third of each year on a voluntary task in an area I am best at, i.e. an area I worked professionally in for so long a time, offers the best return for all involved. The Senior Expert Services ensures a very professional environment for both the expert (me) due to its organization, experience, and worldwide presence, as well as to the client for the extensive list of experts (currently more than 10.000) in various business areas it has access to. Other benefits for myself out of this setup are the satisfaction that comes with "helping to help yourself" in striving economies, working with bright young people, and last, not least, the pressure on myself to keep me completely up-to-date in my areas of expertise.

3. How would you describe your experience with Codespring?

I started working with Codespring mid-2009. Codespring requested expert advisory support specifically in the area of Sales and Marketing, my field of experience, and decided to "try me out" after receiving my CV. Up to the financial crisis of 2008, Sales and Marketing was of no concern to Codespring, as they were busy to serve the projects that got to their desk anyway. So it was very clever of them to ask for external advice as soon as that picture changed and the management team realized its potential weaknesses.

Right from the start, our collaboration was very open, friendly, targeted, professional, and, over time, covered the complete management setup of Codespring. From a very early first analysis of Codespring and its business, an on-going relationship to Codespring and its management developed over the last three and a half years, including two visits of more than five weeks total to Cluj-Napoca, regular meetings at the CeBIT trade fair in Hannover the last three times, and on-going contacts using e-mail, Skype, telephone... In hindsight, looking specifically at Codespring's marketing activities, they turned a weakness into a competitive advantage in less than two years.

4. What strikes you most about a mid-sized software development company from Cluj-Napoca, Romania?

Software development is a people dependent high tech business. Access to well trained and highly motivated people is of the essence, keeping them (happy) is the next crucial point.

Cluj-Napoca in Transylvania, with 400.000 + inhabitants plus 100.000 students, all at least bilingual, represents a perfect base for the recruitment of the people to run such a business. Cluj-Napoca is in all aspects closer to Berlin, Paris, London ... than Bucharest.

Codespring is closely linked into the local academic society, last not least offering internships, Bachelor and Master Thesis workplaces to elite students. On the other hand Codespring is a very attractive employer due to its 14 years of business success in the market place, having access to international projects of highest complexity.

5. In your opinion what is the attitude of German IT&C executives towards the new generation working models?

In talking executives of German multinational companies, they are either driving the virtualization of project teams, including customers, suppliers, subcontractors, consultants, freelancers- or they are (as a company as well as personally) out of business anyway. From the way their own companies operate, they are supposed to be familiar with such set-ups for quite some time (The "not invented here syndrome" may still be a stumbling block- but not for long.).

In German middle-sized firms, however, you may still meet some resistance. Here the tendency towards near shoring as opposed to (far) off shoring may help a geographic and cultural location like Cluj-Napoca over, say, India - but not necessarily so. You should always take into consideration the stunning success of German mid-size companies in the world market, not possible with any kind of stubbornness. Another caveat in this context: Traditionally these companies rather direct their activities towards the geographies they are serving than towards those that are not their target markets. Germany as such represents quite a substantial home market, possibly leaving executives even in ICT markets a little less externally oriented than those in smaller, let us say e.g. Scandinavian, countries. However, if you convince the German executive, you may experience a stable, profitable, long term relationship – well worth the effort.

6. As a consultant what would be your advice for a company when selecting a software development outsourcing partner?

Look for competency, competency, and competency of the people of the prospective partner. Besides technological competency (self-evident) this clearly includes competency in the working language my people prefer, and it includes competency in (cross cultural) team building. The organization I want to work with has to show proof of a minimum of stability (years in business, turnover of key personal...). Then have a look at distances (geographical, cultural, communicational...): the larger the distance, the lower the bidding price. Finally, given all of the above, I will ask my stomach...

7. Over your career, when facing difficult times, what was your biggest challenge?

In turn around management situations, of which I experienced some, the biggest challenge for me was

not the threat of my personal bankruptcy, which impended also twice, but the pressure to sacrifice the wellbeing of some (hundreds of) employees for the sake of the whole.

8. As a seasoned leader, what is your guiding principle?

That changed significantly over time, basically from "I am a democrat as long as everybody does what I say" to "nobody is perfect, but a team can be". More seriously, all the years I held on to a story I got from one of my early bosses. Although it was not his, I never found out who I am quoting: "In the south I met an old man with a rowboat. He ferried passengers across a mile wide river. When I asked him: "How often a day do you do this?" he answered: "As often as I can." This is all you have to know, all there is to know about economy, prosperity, and self-respect." Robert Frost's short form of it: "But I have promises to keep and miles to go before I sleep."

9. At this moment, what is your personal mission, what are your intentions in the near future and what message would you convey to your senior peers?

At the heart of my personal mission remain two tasks: Keeping on living by keeping on learning. So I am committed to continuing my SES assignments as long as I am asked to do so, and continuing with and adding some more non-executive director's seats to my current ones when asked. All the people I can change are: just myself. So let me refrain from giving advice to my peers.

Thinking Point

Key to Standardization of Embedded Systems: Android?

In the century of hand-sized, smart internet devices manufacturers need to address the surging user demand for compound functional requirements. As a direct answer, complex software applications driven by multiple layers are being developed to run innovative capabilities on existing hardware. Managing software complexity at this state-of-art level is possible by using standardized software. Can Android, the embedded mobile framework enjoying widespread support these days, be an appropriate choice for standardization of embedded systems?

Shining Stars of the Mobile OS Landscape

Apple's iPhone is a stable, very well managed platform based on proven technology with predictable release cycles. Nevertheless, it features a closed, rigid and perfectly controlled environment. Apple has been very consistent on platform development and on the policy of owning the relationship with the customers who are willing to pay

for the Apple experience. Software, hardware and online services come from one hand: iPod and iPhone was able to run the latest version of the iPhone SDK.

RIM's Blackberry is a distinguished long-time player on the market, a top-notch option in the first decade of this century. Although Blackberry outperforms all its competitors on today's market in e-mail, it is losing ground due to current consumer behaviour that tends to practice Twitter and Facebook rather than use e-mail as their primary means of electronic communication.

Microsoft's Windows Phone is the most instinctive and visually entertaining OS. In spite of this, it has failed to gain traction being virtually unable to update a Windows Phone OS to a new version without purchasing a new device. Moreover, it has proved to be sluggish and rather not error-free.

Nokia's Symbian is the most sophisticated and technically capable of all major mobile platforms mainly because of long years of user experience, maturity of the OS and high investment efforts. Nevertheless, Symbian OS has lost quite a few battles in the mobile platform wars and is not a true challenger in the USA.

Common in all systems taken under loophole, except for Windows Phone, is that they are produced by one single hardware manufacturer and their software is subject to proprietary ownership. What's more, their software is compatible exclusively with their previous models and nothing else.

What about Android?

Android is a Linux based OS designed primarily for touchscreen mobile devices like smartphones and tablet computers. The Android history really started when Google acquired Android Inc. in 2005, followed by the establishment of the Open Handset Alliance in 2007. The first handset appeared the next year when Google released the open source code of Android under the Apache License which allows free modification and distribution of the software for device manufacturers, wireless carriers and passionate professional individuals.

At first glance, Android appears to be another operating system rapidly emerging as a market leading pretender. However, the disruptive technology introduced for mobile headsets has much higher potential. Android has gained so much momentum due to its highly configurable, freely available and notably compatible nature that makes it appropriate for implementation in embedded systems.

Android enjoys widespread support among geeks, industry users and everyday consumers. It is wide open

to all manufacturers feeding consumer freedom who can choose and easily switch to another hardware manufacturer without abandoning the Android ecosystem and all the purchased paid applications. Open-minded users addicted to change are invited to switch brands upon their will.

Android is a software platform for building connected devices that has managed to create a consistent user experience across multiple devices. The application framework powered by Linux kernel provides an intermediary layer between the application program and the operating system.

Tendencies for Standardization

Gartner data revealed that Google's Android OS will be used on more computing devices than Microsoft's Windows within four years. Gartner has foreseen a number 2.3 billion computers, tablets and smartphones using Android software by the end of 2016, compared with 2.28 billion Windows devices.

Consequently, Android is not only one platform of so many vying for supremacy, but the platform that is threatening to gobble up competition and to become a licensed OS across portable devices and embedded mobile frameworks.

By standardizing on a common licensing platform, manufacturers will be able to practice cost reductions and to manage software complexity. What's more, device producers can easily manage upgrades and license activation that is made consistent across multiple devices. They no longer need to engage in building derivative device types capable of handling and supporting various capability requirements.

As a result, manufacturers can concentrate more on monitoring software usage, determining market claims and meeting market demands.



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