

# The economics of hiring and staff retention for an IT company in Russia

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## 1. INTRODUCTION

One of the biggest problems of the IT industry in Russia today is lack of human resources.

All sorts of educational institutions in Russia are straining to train software engineers, software testers, software project managers and IT system integrators. Among the institutions are the established universities with long-standing traditions in the field, as well as polytechnics and private SW training courses.

The gap in IT workforce is still big.

Some ten or fifteen years ago the lack of SW development resources in Russia was commonly blamed on the brain drain towards the West. Now this is no longer the case – the brain drain to the West has all but stopped. The opposite trend can be observed – IT companies in Russia now list among their employees many Russian returners from abroad, as well as Russians brought up abroad returning to Russia.

The idea of further education of IT staff is also gaining in popularity. The majority of medium to large sized IT companies have established personnel training centers to help induction process or to enhance the SW skills of the newly recruited people. Additional training often increases the company overheads, but there is no other way to achieve people productivity.

It is one thing when the skills that a new employee must get are just the induction into the company business and management processes, adopted technologies and customer culture. It is quite another proposition to teach programming languages or the basics of algorithm efficiency. In this case the quality of recruitment must be considered insufficient, since the new employee cannot reach full productivity in reasonable time.

According to the laws of the market, the deficit of supply causes growth of compensation offered to the recruits. Why relocate abroad when it is enough to change jobs to gain an increase in your salary? There is a lot in favour of staying in Russia– the personal tax is low (it is 13% in Russia), no language problems plus the quality of living became comparable to the West for the middle class. So why not swap jobs every couple of years – with a gain?

The problems accumulate for the employers. Whereas personal tax is low in Russia, the personnel tax for the enterprise is relatively high (26.2% of the person's salary) – to compare, the average percentage for European countries is 15%. The costs of premises, infrastructure and data costs are constantly growing despite hopeful forecasts. As a result it is expensive for an enterprise to hire people if they do not achieve productivity within a short time from start date. Unfortunately, this is most often the case.

The total output of Russian higher education streams producing new IT and SW specialists is in the area of 150 thousand graduates a year. This is among the highest numbers in the world, and the demand for the graduates is still higher. Besides, the quality of graduates varies a lot among the institutions, especially in small towns.

Another widespread problem in Russia is that the new graduates of higher education are not trained in the SW development management processes and in professional communication and teamwork skills. Other blank areas are SW development infrastructure skills – versioning and version control, work planning, reporting, testing and quality assurance, budgeting for time and money per unit of SW and so on. Some other institutions, on the contrary, are guilty of the too down to earth approach – teaching only specific technologies (such as .NET or SAP) without the fundamental knowledge base.

This means that every IT company in Russia must in any case spend money on identification, hiring and training of suitable personnel. In this article we compare two approaches to personnel hiring and retention in IT industry, and we will discuss the comparative costs and benefits of these approaches.

## 2. PROFIT MARGINS OF SW DEVELOPMENT BUSINESS IN RUSSIA

Any software business requires many well-qualified entry-level developers and testers (with work experience 0-2 years). In the organization chart they make up to half of the total production workforce. They usually are also the most mobile employees – turnover of the entry-level staff is higher than average. Entry-level developers and testers as a rule need more hours of induction training, too. So what is the bottom-line profitability of entry-level workforce for the company?

Lets assume the base salary level is \$1000 (this is in the low range but realistic for inexperienced developers). The first overhead that the company pays is the Russian social tax (26.2%).

Both the potential candidates and the company customers are sensitive to the quality of company premises, so the next biggest cost item is rent and service of premises. At the moment of writing (second half of 2008) the cost of renting an average business space in an office building in St.Petersburg is \$35 per sq meter. According to the Russian labour law, a company must allow at least 10 sq meters per employee brutto (including a proportion of common spaces such as meeting rooms, bathrooms and coffee spaces). Therefore the company spends on average \$350 per employee in premises rent.

Overheads per employee include also the service costs – administration, communications, technology and hardware. Service costs are typically calculated as 30% of base salary. We shall add \$300 for service costs. Accounting standards usually calculate service costs together with the rent as “overheads”, but in our case the cost of rent is growing faster than the service costs, so it makes sense to keep it separate.

To keep peace with the tax authorities, a company must show profits (otherwise it will be suspected of money laundering). In Russia the minimum profit for tax report is 10% of the annual turnover. To convert this minimum into the terms of our research, let us assume that it is evaluated as 20% of base salary per employee (which roughly denotes 10% of turnover). Therefore there will be nominal tax levied on \$200 – in Russia the profit tax is 24%, which makes the total tax levied per employee \$48.

Consolidating the expences, we calculate the total overhead per one entry-level staff as:

$\$1000 + \$262 + \$350 + \$300 + \$48 = \$1960$  per month

On the benefits side, the work of the same entry-level developer or tester can be invoiced as customer consultancy or development services at a price of at most \$15 per hour at the current market prices. This makes \$2400 per month (assuming 160 work hours to a

calendar month). This is only the potential – given that this much work will be invoiced in fact.

Unfortunately, it is rare to find the efficiency of more than 85% per employee in an IT company. Sick leave, gaps in orders, training and similar issues take their toll. Therefore the total average profit per employee is:

$$\$2400 * 0.85 = \$2040$$

Evidently, the profitability is low – only 4% (even less than the nominal \$200 prescribed by tax authorities).

The only realistic way to improve the profitability is to sell the services of developers and testers to customers at more than the rock-bottom invoicing price of \$15 by offering a better value of their work. This is, in fact, what the companies do, and they achieve the new customer value by training the employees and enhancing their work experience.

This calculation shows effectively that the entry-level staff retention and further training is a more important goal for an IT or SW company than hiring new entry-level workforce.

In the next chapter we shall consider the methods that the companies typically employ for hiring and retention, and we shall try to estimate their comparative success rate (defined as the length of employment in the same company of the newly hired entry-level staff).

### **3. DIRECT COSTS OF RECRUITMENT IN TODAY'S LABOUR MARKET**

We are concerned primarily with Russian market here, and maybe even more specifically – SW developer labour market in St.Petersburg.

There are approximately 25 universities and other higher education institutions that together yield about 4000 graduates annually with the B.Sc and M.Sc diplomas in SW engineering and related specializations (listed in the Russian Ministry of Education certified qualifications register under category “information and communication technologies”).

The demand for such specialists is estimated to be ten times higher than this number. Ten years ago still many fewer graduates were produced each year, but this was partially balanced by the conversion of other specialists to SW development and information technologies skills under the pressure from the strong IT employment market (and the corresponding stagnation of other engineering employment market then).

Today the trend has changed, the industry in Russia is on the rise, and the retraining of other specialists to IT qualifications has all but stopped.

Large and very large companies enjoy the luxury of candidates seeking employment there without extra effort of the company part. However, the free-flowing stream is not usually enough (and not enough of the right kind for the moment), so even the big corporation allocate budget for recruitment costs. Every successfully recruited candidate costs the company 15-20% of the annual base salary – to be paid to the hiring agency. In our case this is \$3000 - \$4000.

Let us assume that the basic skills are already there (such as SW coding in the right language, knowledge of technology and algorithms). This leaves the need for company processes and management training, SW version control, training in the specific SW development tools used by the company. In addition, there is the induction period when the

new employee is introduced to the specifications, requirements and the code produced for the project/projects that the person will participate.

In short – there is always the need for induction training, and the need is always extensive.

According to different schools of thought, the total “time to productivity” for a new SW developer or tester in a company lies between 1,5 and 3 months (this costs the company between \$3000 and \$4000). This is an underestimate, because in some cases there are also additional third party course training required (another \$1000 - \$2000), and the established staff spends time to carry out the induction with the new employee (estimated \$1000 to \$2000). Sometimes the whole process lasts longer than three months.

However, accounting for all probabilities, we get the costs of induction to be somewhere between \$8000 and \$14000 per employee.

If all goes well, the entry-level developer or tester gets a promotion in one or two years (after participating in one or two successful projects), and to replace him or her recruitment must start again. Therefore, the company should aim to recoup the initial costs of recruitment within two years maximum.

As the calculated profit margin of an entry-level employee is only 4% (see chapter 2) and average monthly sales \$2040, the annual profit per employee does not exceed \$1000 ( $\$2040 * 12 * 0.04$ ). This makes it clear that it is hardly possible to recoup even the minimal initial recruitment costs in two years.

This leads to a natural question – why do the companies go for the expences and trouble if it does not pay in the end?

The first reason is the production volumes – to keep orders coming in, the company must show excess capacity and ability for sustainable growth as needed.

The other, less obvious reason is to do with retention. If staff retention in the company is high, then the company can plan for higher profits generated by this employee later.

In any case, the new hiring cycle must repeat every year, and there is a strong economical incentive to carry it out as efficient as possible.

#### **4. OUR APPROACH TO RECRUITMENT**

In the earlier chapters we have demonstrated that recruitment of entry-level specialists is a tough task and that the associated costs can easily outweigh the benefits. Are there any alternative approaches which may help to make it a more repeatable and profitable process?

Since one of the authors combines work in business with heading the chair of SW engineering in St.Petersburg State University, his thinking was naturally directed towards involving the companies in the teaching process and reaping the benefits from student participation in real-life projects.

The idea is not new and not unique. Industry-funded chairs operated in universities and other higher education institutions still in the USSR times. At those times, in absence of market economy conditions, the cost of training a specialist was not accounted in the same way that we do now. The collaboration was prescribed by the plan, which overruled economic considerations then.

Today many companies support higher education by distributing student grants, research and teaching grants, as well as supplying the equipment, licenses and project costs of teaching and research. All of this helps and at the same time – this type of support is not systematic and does not noticeably influence either the quality of training or the likelihood of the graduates to choose the sponsor company as their first employment.

In some cases that we know a company established a full-blown further education course in collaboration with a university. Almost in all cases the students had to pay themselves for the course – this means that the company in question aimed not only at improving their recruitment prospects, but also meant it to be a profitable business enterprise.

All such attempts that we are aware of have failed due to financial reasons.

Thus a straightforward business idea of training your own workforce when still in education turns out to be tricky in the details of implementation. No surprise that it was not warmly received when proposed to the management team of Lanit-Tercom (company that the first author headed at the time).<sup>1</sup> Indeed, why solve the problems of higher education at the expense of a particular business? What is the motivation for the employees to participate in teaching process?

The answer is that the benefits are mutual. For the university it is in the quality of the graduates, in the recruitment index and the ratings of the chair among the best employers. For the sponsor company it makes the recruitment almost foolproof and radically cuts the induction costs for the new employees.

Put this way – this is an attractive proposition. So it also turned in practice, after a period of trial and error and process adjustment. Lanit-Tercom and faculty of mathematics and mechanics of St.Petersburg State University succeeded in implementing a practical teaching process putting all students through participation in real-life SW development projects, and recruiting 20 to 25 people annually to Lanit-Tercom directly after graduation. The costs of recruitment and induction dropped, and the retention of employees recruited in this way is higher than average retention in the company.

The collaboration was started almost ten years ago and continues now with the stable rates of success.

Here we shall capture the main points of our approach that were operational in creating the success story. We think that similar collaboration can be reproduced with equal measure of success if certain basic conditions are met.

First of all, the education partner in collaboration must teach a firm foundation of courses in mathematics and in information sciences. Theoretical basis is essential for high-quality SW engineers, and no amount of work experience can replace it.

It helps if the program includes the SW project management disciplines reflecting the state or art in current processes (adopted by the companies not only locally, but international, too). Whereas Russian higher education is traditionally strong in theoretical subjects and teaching the classical art of programming and testing – it is less strong in practical disciplines related to SW production.

The task is made easier if the university (or other higher education partner in collaboration) follows the international standards in teaching, such as Computer Science Curricula 2001 or

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<sup>1</sup> In the summer of 2008 Lanit-Tercom has been merged with another company Artezio and the resulting company now operates under the name AT-Software

Software Engineering Curricula 2004. For example, these standards were translated into Russian and adopted for teaching in the faculty of mathematics and mechanics of St.Petersburg State University since 2001.

What is the role of the collaborating company partner? Briefly – inviting students in on SW development project participation and spending time in developing their communication and process skills. This is how it happens, stage by stage.

By any standards of higher education, Russian or international, SW engineering students must do some research work in their third and subsequent years of education. In addition, M.Sc. students also produce their master thesis in their final year.

The collaborating company can participate actively in all these activities by:

- Appointing supervisors selected among the experienced project or team leaders who will take care of individual student's practice
- Appointing group tutors who will supervise group project participation (recommended by the above mentioned SW Engineering Curricula)
- Supplying the process framework and the necessary equipment for students' participation in SW development projects
- Providing timely and accurate feedback on each student's project work to the faculty
- Supply teaching some of the newer subjects in SW engineering if the faculty staff cannot cover the topics yet

To sum up, the third requirement towards successful collaboration is the readiness of the company to commit to the tasks listed above.

Apart from the money issues, two main questions must be resolved by the partners before entering the collaboration:

- How close are the technologies and algorithms developed in the company to the profile of the teaching partner? Will there be sufficient scope for the students to implement in the projects the disciplines they are taught?

- This issue must be addressed by careful selection of collaboration partners.

- What is the guarantee of success? What if the company spends time and money on student training, and the students apply to other employers after graduation?
- In our practice this is a surprisingly low risk. The issue is close to the problem of retention, and the same rules apply – good conditions and emotional commitment created by individual attention ensure that the majority of students are willing to consider employment in the collaborating company.

The commitment created at the first recruitment continues in high retention figures during employment. Our numbers show that on average an employee recruited to the company via this process stays with the company almost twice as long as an employee hired in the usual way.

## 5. HOW DOES IT WORK IN PRACTICE?

Let us take for example Lanit-Tercom budget for collaboration expenses in academic year 2006/2007. We shall start with a detailed description of the company participation in teaching process, so that the items of budgeting make sense.

One of the key methods to engage the students initially in the SW development project and processes is to conduct regular seminar-type workshops led by the experienced project managers from the company. Students from the informatics stream of the faculty, as well as other students from the same faculty (and sometimes even from other departments or institutions) attend these seminars. All attendees are divided into relatively small groups (5-10 people in each). At this stage no selection or restrictions to attendance are in place.

The seminars are part of regular workload for Lanit-Tercom employees who volunteer to lead them. The company aims at finding volunteer leaders from each company department, so that they cover maximally large areas of IT technology expertise present in Lanit-Tercom. Thanks to the wide coverage, most students find an area that interests them best, and start to dig deeper.

Each group works according to a common learning plan. At the beginning of year the leader holds a few sessions of "induction" to develop the background knowledge about the SW production process and tools and practices used in it. At the same time the induction sessions help to bind the group together, to start acting as a team. The leader and students have time to discuss the proposed project briefs, and to make a guided choice for each student- which project he or she will join.

Then the project phase starts. Each project is led by at least two Lanit-Tercom employees to ensure continuity of guidance in case of absences (business trips, deadlines, sick leave). As a rule projects last for three months.

The topics for the projects are selected by the faculty members and by Lanit-Tercom student group leaders together, in close discussion. The final list of topics is approved by the chair of SW engineering, evaluating both the theoretical value and whether the project will fit into the curriculum. Under these conditions, the projects can be submitted to the faculty as the official yearly project (of course if it was completed before the deadline).

Each topic makes a joint project work for several students as a team. This is a must if the aim is to develop the skills of large-scale SW development. It is interesting to note that we do not appoint project leaders from the students – they come up naturally in team interaction.

When a project is completed, the project team makes project presentation for an approval review. During the review, every project team member must tell about their part of work and their understanding of the results and process. We evaluate not only the content of presentation but also the presentation skills.

For the best students, selected from all project teams, we offer the possibility of a summer school during the university vacations. Summer school consists of four hours training a day for a month. Lanit-Tercom pays a small stipend to summer school participants, including bonuses paid for the best participation.

For example, in 2006-2007 we formed nine student project groups, counting 80 participants in total. By the time the projects have finished 60 students remained committed. This is considered a success – at the beginning, in earlier years of collaboration, the final count was often less than a half of the starting count. The improvement is due to the better choice

of project subjects and the steep learning curve that both the faculty and Lanit-Tercom took in organizing this type of collaboration.

## **6. HOW MUCH DOES IT COST TO THE COMPANY?**

Each Lanit-Tercom employee participating in the scheme is paid a small bonus (\$100-\$200) in compensation of approximately six hours a week workload. These six hours come from the normal working schedule, so that the productive work suffers as a result to some extent. The company accepts this as part of the deal in getting better workforce in future.

In the year 2006/2007 Lanit-Tercom spent \$30000 for the student projects and teaching, and 30 new graduates were recruited in the same year (each recruitment cost approximately \$1000 to the company). It is true that the needs for induction and additional training apply also in the case of hiring the students who went through the practice process, but the resulting quality is reliably high. Most of the current department heads and team leads in Lanit-Tercom were originally recruited via the same process.

However, the total need for workforce in Lanit-Tercom is bigger than what this process brings to the company. Besides, in some cases specialists in areas that we do not teach ourselves are needed. This is why Lanit-Tercom HR service is also actively recruiting. For example, in the same year 2006/2007 20 people were hired to the company in the usual way. Therefore we have material for comparison of both traditional and customized recruitment.

## **7. IMPLICATIONS TO STAFF RETENTION**

It is hardly surprising that the HR studies list compensation as the most important factor of staff retention in a company. Staff surveys at Lanit-Tercom confirm that this is indeed a strong priority for most employees.

Having said that, here is the full list of retention factors, consistently named by Lanit-tercom staff:

1. Large stable company with comparatively long standing in the area
2. Close links to St.Petersburg State University, specialization in high technology projects
3. Diversity in product and service lines, opportunities to gain expertise in various subjects and technologies
4. CMM certification ensuring efficient management and established production processes
5. Competitive salary
6. Other forms of compensation:
  - Private medical insurance paid by the company
  - Free foreign language lessons for the employees
  - Fully official salary and fulfilling other trade union requirements
  - Corporate entertainment



Gathering and utilizing insight on the real priorities for people, measuring the relative impact of changes in each of the retention factors, and applying the knowledge to our people strategies – all these has helped Lanit-Tercom to reduce staff turnover from 12% five years ago to just 8%.

Our findings confirm that even in the employee market the people do not leave a company because the grass is greener somewhere else – but because it is “not green enough” in the place they are leaving.

The retention index for a particular employee consists of compensation and non-monetary factors. It is clear that the compensation package is the same (or close enough) for all newly recruited employees – whatever the method of their recruitment. If there are differences in average retention length for people hired in the traditional way (via agencies and advertisement) and hired via the academic collaboration program – these differences must be explained by non-monetary reasons.

This is what we see in practice. As already mentioned, on average the employees recruited through the academic collaboration scheme stay with the company up to double the time compared to people recruited in other ways. We are justified in assuming that the reasons like collaboration with the university, technology-intensive production processes, and especially –familiar product and business processes play an important role in these people’s motivation to stay.

## 8. CONCLUSIONS

This article dealt with the economics of recruiting entry-level staff to an IT company in Russia, given the conditions of undersaturated labour market.

We demonstrated that the traditional recruitment with the help of agencies and advertisement results in high initial costs of hiring and induction, which may not be easily offset by profits if the turnover is relatively high in the company. Even with the typical international statistics of retention in IT area (3-4 years in the same place) it may be hard to break even when recruiting entry-level staff.

It is also dangerously easy to slip in quality of induction when balancing the costs of recruitment.

On the other hand, collaboration between IT companies and academic institutions of higher education looks favourable and mutually beneficial. Viewed as a method of recruitment, it can bring a steady flow of applications to entry-level positions and at the same time – reduce the budget for induction and training by shifting a large part of training earlier, to the time when students participate in collaboration program.

Certain conditions, described in chapter 4 of the paper, ensure the success of collaboration for both academic and industry partner.

We analyzed the example of a long standing collaboration between St.Petersburg State University and Lanit-Tercom and calculated the budget allocated by the company for the purposes of student training.

In addition, recruitment via the collaboration program has been shown as an efficient retention mechanism, helping to increase loyalty in the newly-hired employees. The increase in loyalty is due to the factors that are strongly improved with the pre-hire training – and their priority and validity are confirmed by the employees rating them in anonymous surveys.

We hope that the intent of this paper will be fulfilled if more companies operating in IT field in Russia prove the feasibility of collaboration with academic institutions by creating more success stories of their own in a similar way.