From newbies to professionals and vice versa: An exploration of IT enabled relationships

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Abstract

Through this thesis I aim to bring forth how IT (information technology) could be used in different ways to create a better collaboration between students and companies. My intentions are to explore and observe what the demands are from both parties and find out, if it is the lack of an up to date platform that causes discrepancy in establishing relationships. Due to the limited time accorded for this research, I will focus on evaluating the platform, LinkedStudent and elaborate a design suggestion in attempt to enable a better collaboration. The research question is “How would it be possible to create a close relationship in between students and companies with the help of IT?” This paper endeavors to shed light on issues like usability, user experience and web 2.0 both theoretically and empirically.

With the amount of knowledge I have gathered during my study years I opt for a deductive approach of the problem, which on the course of the research through induction will be proven. The core assumption being that an innovative and warm environment can be created on a platform by interacting on the Web through organized communities with dynamic capabilities. A platform can be the optimal solution to establish relationships based on common interest.

Acknowledgments

A thesis is not something that can be done in isolation, there has been a lot of input from various sources that I am extremely grateful for.

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On a more personal level I thank my parents Szabó Samuel and Szabó Rozália, and my grandmum Benedekfi Rózsa for their huge amount of love, kindness and support. My kitties Cici and Sissi who stayed beside me and kept me warm. Also my friends and colleagues, for putting up with my argumentation, questioning, and sick jokes due to sleepless nights. You all know who you are! =)
1. Introduction

There is always a start and there is always an end. In respect to newbies and professionals, the importance is the time interval and what is in between these events. As a newbie, you still got dreams and you are ready to fight for them to take over the world. But as a professional, you settle in a dogma which becomes your comfort zone. The business market as it is, will always require the collaboration of these two parties to learn and be receptive from one another by adapting their different ideas.

Newbies are eager and lack the sense of reality while professionals got way too much sense of reality and lack the eagerness of finding new perspectives. Balance is necessary for success!

As Fitzgerald (1997) writes, documentation done by an amateur is the same as documentation done by the professional, just that it contains a different understanding and meaning to it. The understanding process of an amateur and a professional has got a U form; where the evolution happens in the bottom.

1.1 Background

Since the introduction of universities, diversity has increased for students, not knowing for sure what job opportunities expect them once finishing their studies. Even if you take a field like studying to join the police, becoming a nurse, or teacher you still got difficulties knowing for sure what you become unless you specialize in a specific area and it turns out that the market still got the demands for what you have specialized for.

In case you would want to have a high certainty of getting a job, it is foremost advisable that after high school you go on a path directed study such as trade school, vocational training or apprenticeship. Though not equivalent to a university degree it promises higher probability for a job as you constantly collaborate and work beside/with a company. Path directed study has been the trend during the age of industrialization.

“We are going to become an information society, overloaded with information, but with the chance of having technical information processing capacity at ones disposal everywhere ... ” (Haefner, 1981, p 526)

The above quote shows how authors write at the beginning of the 1980's as they are making way for the information age to take over the industrialization. Engineers and programmers are mostly the only ones who are taking advantage of the information technology. They are
also developers and users at the same time. A fraction of these scientists offer time to reflect
and study the development of the information age when these questions arise:

“So we are entering the computer future, but what will it be like? What sort of a world
will it be? There is no shortage of experts, futurists and prophets who are ready to tell
us - only they don’t agree. The Utopians promise us a new millennium, a wonderful
world in which the computer will solve all our problems. The computer critics warn
us of the dehumanizing effect of too much exposure to machinery, and of disruption
of employment in the workplace and the economy.” (Papert, 1987, pp. 3-4)

A mixture from eagerness, threat and fear awakens in society facing the questions if
information technology shall achieve new solutions and processes, or will it just maintain the
current situation through automation while avoiding responsibility?

“By great good fortune, and just in time, we have to hand a device that can rescue us
from the mass of complexity. That device is the computer. The computer will be to
the organization revolution what steam power was to the industrial revolution. The
computer can extend our organizing power in the same way as steam extended
muscle power... Of course we have to ensure that the result is more human rather
than less human. Similarly we have to use the computer to reduce complexity rather
than to increase complexity, by making it possible to cope with increased
complexity.” (DeBono 1979 pp.18-19)

Earlier Weizenbaum (1976, pp. 31) has already mentioned that “Yes, the computer did
arrive 'just in time'.” to solve some administrative problems, but really it arrived “just in
time” to prop up a system that would have otherwise become untenable.

According to the statements gathered by the authors above, computerization in the
information age is about a process of sustainability; that is, we do not act to improve
situations, but rather to maintain a balance. However, the important issue that still remains
is:

“to understand the modalities of growth of such information and to monitor it’s
development so as to master the consequences... The role and responsibility of
education in this respect are indisputable” (COECD/CERI, 1986, p. 11)

Information is not classified as knowledge until the time that it has been shared, evaluated
and established by credible sources such as scientists, as a valid and proven fact. Therefore,
the use of different kinds of web platforms are to be appreciated, through which a fair social
distribution of social benefits/information, adds to technological progress. The web also
improves the efficiency and effectiveness of administration while everybody can be a social
citizen by sharing information and making decisions. Weizenbaum (1976) states through
ELIZA that information and communication technology is shrinking the world and it is
brining us together. What computerization has brought and the way education has dealt
with the waves of industrialization in order to find a well suitable place for each person, have
awakened an urge to improve an already established relationship in the information age,
between the market and students, so that not only apprenticeship or vocational training can
assure a student with a steady job but universities as well.

The approach of this problem has started with a pilot study from a deductive point of
view, where through observations, conversation and a predominant marketing research, the
need of engagement for creating relationships has come forth. The knowledge of how well
grounded this need for creating a relationship has came to my awareness through interviews
with different entities that try to create a collaboration between the student life and the trade
and industry.

Documentation that has been available to reuse are research papers encapsulating
statistical analysis about what the chances are for students who have had collaboration with
companies during their study years and the employability level it has given them. Available
has been data considering statistical analysis about yearly trade fair (Uminova) that Uniaden
arranges at Umeå University.

Having a solid base built up on these information, that there is in fact a demand for
creating a relationship in between students and companies, this thesis analyzes how this
relationship can be established in the best way possible.

1.2 Research question

“How would it be possible to create a close relationship in between students and
companies with the help of IT?”

1.3 Purpose

“The right kind of story telling promotes freedom, to be different and individual
while conserving the unity of love and mutual respect.” Pask (1990, pp. 217-228)
The purpose of this thesis is to point out the importance of establishing a solid relationship in between students and companies with joint collaboration of faculties for the growth of each individual as a part of the system. For this to happen the information age has got its own tool called IT, which handled right can ease the space and time issue according to each users needs. Licklider and Taylor (1968) speculate that Internet based communities are shaped by common interest rather than geographic space.

With the help of IT I intend to find a solution, from a technical point of view, to make a student-company collaboration possible. This relationship would in theory shorten the theoretical study time and would extend the practical study time. The relationship would also give more understanding and confidence for students by ensuring certain starting grounds and a higher employability.

2. Method

2.1 Qualitative method theory

According to Jacob (1987), Smith (1983), Creswell (2003), most qualitative methods are based on investigations that seek answers to questions. Methodologies used are ethnographic, naturalistic, anthropological, participant observation through which evidence and answers are collected. Through qualitative research you seek understanding to a problem related to the population to obtain values, opinions and behaviors.

“To understand a particular action requires an understanding of the context within which it takes place, and to understand the context within which it takes place requires an understanding of the particular actions.” (Smith, 1983, p. 12)

The realistic side of the issue is being taken in consideration while the researcher becomes an integral part of the investigation (Jacob,1987-88) which can result in contradictory behaviors, opinions, emotions and relationships.

According to Boeree (2005) the roots of qualitative research are based mostly in social science, therefore the concern is about understanding why social behaviors are as they are and what makes people behave as they do; the foundation to their knowledge, beliefs, attitudes, fears; e.g Why do students and companies seek for a better understanding and relationship? Boeree also mentions that the qualitative method is based on realism and as the name indicates quality is hard to measure, therefore it is often ranked lower than the quantitative method, being graded as less scientific. Mays and Pope (1995) write about the
bias and drawbacks with a qualitative research in the British Medical Journal, nevertheless these can be avoided by being structured and concise.

Characteristics of the qualitative method; understanding of purpose, reality and viewpoint: (Changing perception of reality), holistic focus, discovery orientation (The collected data is perceptions of people resulting in subjective theories), collection instrument: (natural condition) and result(contributes valid, deep and rich data).

According to Creswell (2003) there are many ways a qualitative research can be conducted, nevertheless knowledge and reflection upon one’s own experiences is the beginning of understanding.

“...the essence of understanding is to put oneself in the place of the other - something which is possible if one possesses a degree of empathy with the other or has the disposition to recreate the experiences.” (Smith, 1983, p. 12)

The choice to approach this research from a qualitative way using different criteria to evaluate the platform, is mainly due to the fact that these criteria have since long existed. Criteria prove to be stable according to earlier studies and development over time, whereas persons perspectives and points of view change with time and with the change of the environment, therefore I consider surveys unstable and not suitable in this case.

By using a qualitative approach I will produce comprehensive information that will have a more in-dept, yet wide understanding of the entire situation and the demands at this time.

2.2 Research process

My study is based on three steps: A pilot study, an expert evaluation and a design suggestion. First, I did a pilot study to find out if there exists a relationship between students and companies and at which level. Through the pilot study I became aware of the level of willingness among companies and students to establish a relationship, and the way relationships currently are created.

My pilot study is followed by an expert evaluation in order to evaluate the Linked Student platform. By applying criterion from usability and user experience to evaluate the platform, the result will be objective till the necessary changes can be applied to improve the platform. The expert evaluation also fits in better to the time interval devoted for this thesis to be written.

Finally, I present theories from interaction design, web 2.0 and dynamic systems in my design suggestion that aim to help improve the relationship enabling capabilities of Linked Student.
These three steps have a number of limitations: time, knowledge, interviewees, platforms and several other obstacles. These limitations will be further discussed below. I would also like to mention that in certain measures language limitations might have occurred creating misunderstandings, nevertheless the relationship with those I have interviewed has never been harmed.

2.2.1 Pilot Study

The pilot study was designated to help me research the willingness among students and companies to establish a relationship. I employed three different data collection techniques that are summarized in table 1.

<table>
<thead>
<tr>
<th>Data collecting techniques</th>
<th>Nr of Students</th>
<th>Nr of Companies</th>
<th>ENS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Informal/face to face interview</td>
<td>17</td>
<td>36</td>
<td>-</td>
</tr>
<tr>
<td>2. Meeting interviews</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>3. E-mail interviews</td>
<td>-</td>
<td>22</td>
<td>15</td>
</tr>
</tbody>
</table>

Table 1. Qualitative data collected among students and companies

Students have been interviewed from Informatics, Physics, Political science, Social science and Computer Science faculties. A lunch meeting has been arranged with two students, their background being in Mathematics and Computer science.

The majority of the companies interviewed deal with IT most of the time or deliver services for other companies, which can give a biased result when it comes to how does the rest of the trade look up on a relationship enabling process or environment. Most of the informal meetings have been conducted during the trade fair arranged by Uniaden, for companies from all over Sweden; KnowIt, Sogeti, Accenture, Umeå and Skellefteå municipality, Tieto, Vectura, Logica, Peab and other. While attending arrangements organized by the Science and Technology corps (NTK) I have learned to know different companies situated in Västerbotten, having the chance to conduct deeper e-mail interviews after the event. SCA and M-real were two of the companies I have had e-mail interviews with.

Interviewing during meetings and e-mails have been done at several occasions with ENS in order to discover the options for a relationship enabling platform instead of the commuter one that they offer at the time being.

In addition to the qualitative data I have had access to quantitative data as well. Thanks to Uminova’s (a student organization within NTK) evaluation of the trade fair called Uniaden
and statistics done by the higher education survey from the confederation of the Swedish enterprise (2011), I had access to quantitative data about student-company collaboration in higher education.

The option to approach the subject both from a deductive and inductive way is mainly to get a whole understanding of the process and to recreate the bigger picture. In other words, it is unlikely that any researcher could genuinely separate the two processes of induction and deduction - “both are always involved, often simultaneously,” and “it is impossible to go theory-free into any study” (Richards 1993, p. 40)

Pure induction with no prior theory might prevent the researcher from benefiting from existing theory, just as pure deduction might prevent the development of new and useful theory. Thus Parkhe (1987, p.253) argues that “both extremes are untenable and unnecessary” and that the process of ongoing theory advancement requires “continuous interplay” between the two.

I found that during my pilot study the time limit has induced certain limitations, mainly realizing that the range of the study is too wide for the time that it has been accorded. Students are represented by only six departments, which can rise bias in results regarding the interest for enabling relationships. I did however manage to interview students from all years, concluding that those closer to their graduation find these questions more important. Moreover I realize that I should have had a higher variation when choosing companies to interview, as in this case all of the companies participating handle IT on a daily basis. This could make them more interested in IT-enabled student relationships, which may not be the wished solution for all companies.

2.2.2 Expert evaluation of Linked Student

I have conducted an expert evaluation, which is a form of inspection method, where a user interface is being evaluated by a specialist with the help of heuristics (Nielsen, 1995). According to Nielsen (1995) inspection methods can be software inspection, for debugging and improving code, or of usability inspection to evaluate user interfaces. For usability inspections the user interface can be measured automatically, empirically, formally and informally. In my case, restrictions like; no budget and short time frame has directed me towards an informal usability inspection method. In this case I dare call myself the expert and perform a heuristic evaluation according to established usability principles.

Through criterion from usability I evaluate LinkedStudent for relationship building purposes. Due to my limitations, like having little experience of inspection evaluation and a single evaluator, the evaluation is biased from my perspective and I have probably not found all usability problems in the platform. However the criterion applied are based on existing
theories which help avoiding the bias problem. Furthermore, there are limitations in time and budget, the risk that the alteration I suggest might not help as much as I hope for the relationship establishing. Although according to Nielsen (1995, p. 377) “Several studies have shown that usability inspection methods are able to find many usability problems that are overlooked by user testing.” During my evaluation I go through Linked Student several times and inspect all pages. I also inspect various dialogue elements which I compare with the established usability principles (heuristics) in the next chapter.

2.2.3 Design suggestion
Once becoming aware of the existing flaws, I present theories of interaction design, dynamic systems and web 2.0 that serve as the base for the design suggestion in form of a redesign of the platform with the aim of importing the relationship building capabilities.

2.3 Research object
LinkedStudent is a platform created by the unit for business and society (ENS). It is a unit linking students and trade situated in Umeå, Sweden, on the university’s campus. The main objective for ENS is to create a platform that eases maintenance, yet fulfills the purpose to link the two parties. I became aware of their interest for a further development of the platform by meeting them on several occasions as mentioned in the pilot study. In the beginning of 2011 ENS released a new platform called Linked Student on Umeå university’s website. The platform is meant to help improve the relationship between students and companies.

The platform is a very good initiative and a very important first step towards finding a solution to bring two worlds together. The fact that ENS is located on the campus, and that they are willing to collaborate on a further development of their platform has made it into a perfect research project.

As it shows in figure 1. students and companies have separate domains. Linked Student is meant to help students and companies to interact through the platform, while in this case students and companies are separated. The common ground is the mutual interest for a relationship and the platform Linked Student.
On the right of the page the unit offers services like reviewing students CV’s, coach them through written documents and give interview training. It is also very easy to take contact with the unit through e-mail or face to face as they have got a Drop-in service. Their webpage looks very much like the university’s, with the only difference that it does not belong to either of the domains made available by the university. Accessing the page for students you can find thesis projects submitted by different companies, internships and job offers that are available to apply to. If you access the page for organizations a formal template is presented for employers to fill in and submit the task.

As an overall view of the platform, ENS makes students and companies available for each other in a safe manner. Companies cannot publish tasks, jobs or projects that ENS does not approve of, neither do the companies have direct contact with students. With the regards to where students and companies are positioned, ENS has got a mandatory mission to be the intermediate for the two parties and is very good at it. We might even be able to compare it with the first form of telephony. When a number has been dialed, the operator contacted the two dialogue parties through a switchboard. In this case, ENS is the switchboard that aims to enabling relationships between students and companies.
3. Pilot study

My professors at the department for Informatics have with several occasions introduced system developers, consultants and programmers from different companies who also been students before becoming professionals. They have always expressed a relenting interest for us students. With the help of different student association like Umsys, Uminova, Umeå student Union and “Möjigheternas dag” in Skellefteå I became aware of several more companies and their interest for collaboration.

Since I started my studies at Umeå University, through the systems development program I have had the chance to attend different conferences and meetings with companies that would best represent our future employers. The number of students being interested has not been extremely high, which I later on found out was due to not understanding the level of seriousness. Nevertheless the ones who attended were very eager to keep and strengthen these new contacts, therefor the relationship question and issue has been on my schedule since over three years, not only as a student but as a leader of the relation committee in Umsys. On the 25th January 2011 beginning from nine a clock I attended the trade fair called Uniaden and interviewed several company representatives, getting a more in dept information if the feeling about having a student company relationship is mutual. Companies as Accenture, KnowIt, Vectura and others have showed interest and asked for further contact when a mock up is available on a platform that could enable relationships. Already in February I got in touch with the supervisor I had at the time being, and thanks to his valuable advise I contacted the unit for business and society situated at Umeå University’s Campus. I e-mailed Marilott Nyhamn the representative of ENS and Frank A Lott, the technicalities representative for ENS and established a meeting on the 23rd February. They were eager to collaborate, especially when we got in to more details about designing a mockup, that is not only meant to be for the means of research but functional as well. During several other occasions we have had meetings on how their existing system is functioning, how my drafts would make a change and in case it is applicable. In the beginning of May our collaboration has stopt, as I have not been allowed to conduct my research according to my plans. Mid-May we continued the conversations when I found understanding and support from my, at the time being, supervisor and structured my research.

Uminova (arranging Uniaden), but mostly ENS have kindly supplied me with documents about statistics related to companies opinion and students experience related to the encounter of each other. Documents that I have achieved to collect throughout our interviews are statistical analyzes over the need of creating a relationship between students
and companies and satisfaction measures related to earlier encounters and the way it influenced students and companies. Statistics show according to Uminova’s analyze (which I acquired on the 29th of March) of the trade fair that companies have been very pleased by the student engagement. The results are due to a written survey that companies filled in during the trade fair.

![Figure 2. Document acquired from Uniaden showing statistics about how pleased companies have been with the number of students visiting their stand.](image)

Figure 2. can be interpreted as following: there is a sample of 83 persons, where throughout mathematical calculations it comes forth that:

- 41% of the companies are very pleased
- 52% pleased
- 4% not pleased at all
- 3% have not answered

With assistance from ENS I have managed to collect several information sources with statistics about how interaction and integration helps both students and companies. The Higher Education Survey from the Confederation of the Swedish Enterprise (2011) statistics shows that during 2010, 60% of the graduates acquired qualified jobs, while 22% accepted jobs they were overqualified for and 18% either stayed unemployed or are students. Almrud (2011) from the Higher Education Quality (högskolekvalitet) states that only 50% of the graduates acquire qualified jobs, meanwhile companies hassle finding employees with the right competence. She also points out that in the latest five years the university-enterprise interaction and integration has improved graduates chances to qualified jobs with 84%.
The results displayed in figure 3 are based on a sample including 944 university program managers, telephone interview of a sample of 8096 graduates between 2009 July and 2010 June, and statistics from LADOK database. On “högskolekvalitet” (higher education quality) homepage there is also an available tool to compare universities and programs based on gauging university-enterprise interaction and integration.

Almerud, Hjortzberg and Krassén (2011) state that good cooperation in education increases the likelihood that graduates quickly find a qualified job after graduation and it also gives a higher salary. Based on this year’s establishment survey, good cooperation in education increases the odds of getting a qualified job with 87%, increases the odds of getting a job within three months by 71% and leads to an average 2.1% higher starting salary per month, equivalent with 479 SEK. A second level graduate gets an average of 3.8% higher salary, equivalent with 867 SEK. Gender does not matter in terms of the probability of getting a qualified job, however, the odds to a qualified job is 30% greater among those graduating below 30 years of age.

All facts point to the advantages collaboration can bring, the question is “How to make this possible?”. As a result I initiated to look at ENS’s platform to find out if their level of IT is sufficient enough to establish a bridge for students and companies to create a web based community.
4. Approach of the expert evaluation

In this chapter I present usability as a criteria and introduce certain aspects of user experience. With help of these criterion and aspects I conduct an expert evaluation of the platform.

4.1 The properties of usability and user experience

According to ISO, Nielsen(1993) and several other authors that have defined usability, it is a way to measure how easy or hard it is to use an interface, therefore it is a quality attribute. Usability applies to anything with an interface, whether that is a mobile phone, an application, a website or in our case the LinkedStudent platform. Usability encourages a freely flowing interaction and it’s relative to two things: who is it meant for and what do they try to accomplish through the platform. It also means methods that can improve and give an easy usage during the design process. It is defined in part 11 of the ISO 9241 standard (BSI, 1998) as “the extent to which a product can be used by specified users to achieve specified context of use.” ISO definitions for usability are: efficiency, effectiveness and satisfaction.

Figure 4. A layer view of usability(www.welie.com/papers/dsv-is99.pdf)
In Figure 4, we can observe a layer view of usability explaining in detail how some attributes are impacting others or just simply improving them. As an example consistency can improve learnability, when in real time it speeds up the performance of the user, easing the work flow. The user experience of the design knowledge, has also got a special impact, the aim being to have a clean, consistent pattern easing the users hassle with new difficult processes to memorize, replacing it instead with satisfaction.

Efficiency, effectiveness and satisfaction are rather abstract and difficult to apply in practice, therefore usability can be broken down in three different levels which are based on well formed theories according to Bevan (1994). Viewing the figure from a horizontal perspective:

Usage indicators have an impact on usability and are observed while working with a system. For example a good performance speed and the easy learning of the system indicates efficiency.

At an even lower level of usability there are the means. Means can not be observed in the user tests and are not goals by themselves. Consistency has got a positive effect on learnability so do warnings to reduce errors. If not being in contact with the system for a longer period of time, the systems level of memorability is of importance considering how easily the user’s proficiency can be reestablished. The errors of a system can be kept down by tests which is advisable to ensure quality, as due to errors and how easily the system recovers when an error occurs can determine the future of a product. The means have an impact on indicators and mainly have a lot to do with design of the platform and the dynamics, as feedback, warnings and undo helps satisfaction of the user.

Knowledge is a source for improving means and in this case stands for the knowledge of the user. That is the humans interacting with the platform, knowledge of the technology and what the tasks ought to perform. When design knowledge is applied on an interface, guidelines give an explicit outline to how change used by the means impact the usage indicators.

To sum up, usage indicators are observable goals and show the usability level in practice while users are working with the system. Secondly, means are not goals by themselves, nor can they be observed in user tests, mostly they improve usage indicators. Finally, at the lowest level is knowledge, which is a source for improving referred at the designers knowledge of the human, design and task.

Viewing figure 4 from a vertical point of view, shows that:

From the perspectives of efficiency; at the level of usage indicators learnability and performance speed enable efficiency. It has to be easy to accomplish basic tasks on the first
encounter with the design; therefore it is good to stick closely by standards to ensure fast learnability. Once this is accomplished, it is up to how fluent the work flow becomes, that is speed of performing tasks efficiently.

A level lower, means; like consistency, adaptability and shortcuts enable the performance speed usage indicator, and the task conformance enables learnability. Consistency on a page means the uniform way of putting together a page, following paths, patterns, colors same font and size and even selecting functions in certain means in the same way. Before printing, sending or closing a document an action is performed, asking either to proceed or not. The adaptability in this case is, how well the functions are arranged on the platform. For advanced users shortcuts are made available instead of the menu. By making shortcuts available more paths of different length can be made available as well. Task conformance is the degree to which the system supports the task model/user's tasks. In this case the task is to be an intermediate between students and companies, so the task conformance is the purpose of commands, methods and how simple it is to apply.

From the perspectives of effectiveness; at the level of usage indicators errors/safety and memorability enable the effective usage of the page. According to Nielsen (1993) a good design is better than an error message, and a low error rate contributes to effectiveness. Nevertheless in this case error messages represent a certain safety, communicating to the user about the systems performance. On the level of means, warnings and feedback’s reduce the amount of errors, while the user mode is a source for improving the knowledge. From means feedback’s have got an impact on memorability, helping the user to perform tasks after a longer absence from the system. Here too the user mode is a source for improving knowledge.

From a satisfaction perspective; It is harder to identify what is satisfaction for a user therefore, “undo” and “adaptability” from the level of means can have an impact. Nevertheless the task defines whether the user experience is satisfying or nay.

The evaluation of the platform is applied to the following properties:

- **Efficiency:** Good performance speed and easy learning of the system.

  “The more users' expectations prove right, the more they will feel in control of the system and the more they will like it.” (Nielsen 1993, p. 68)

- **Effectiveness:** The level of memorability (patterns/consistency in the path), the users feeling of safety and low level of errors.

- **Satisfaction:** Adaptability, undo and dynamic capabilities help rise the satisfaction level. According to Nielsen(1993) a good user interface reduces costs involved in training and maintaining, making users engage more and giving a higher satisfaction level and therefore content users.
4.2 Expert evaluation of Linked Student
I have made the evaluation based on three usability perspectives: efficiency, effectiveness and satisfaction.

Efficiency I evaluated through learnability and performance speed indicators. By applying these I find that Linked Student respects the pattern standards, colors and structure of their platform throughout the whole page, creating transparency and making it easy for the user to learn. Regarding means like consistency, the path to Linked Student is not done through neither of the present categories on Umeå University's website; “Startsida”, “Utbildning”, “Forskning”, “Samverkan” or to “Om universitetet” categories. The broken path creates confusion and lowers the performance speed, likewise the learnability of how to find the platform. Adaptability and shortcuts are both respected on the platform, see figures 1, 5 and 6. It is easily recognized which domain is for students and which is for companies and already at the first page a shortcut is made available to the option “seek for a task”.

The shortcut gives users reward through being able to directly access tasks for students and add tasks for companies. These categories can also be found as one of the options you would be able to choose later on if you would enter through the link “För dig som är student” or “För dig som företagare eller organization”.

![LinkedStudent for students](image)
Information about how to get help and contact persons to all four communities appears on the right side of each page, very visible to the eye. By clicking on the name of the person your computer automatically starts a program called Outlook express, a mailing program used by Windows. Thus the broken path learnability is not fully functional conformed to the task. Likewise in case of performance speed, the only disability comes forth through the inconsistency of the path to find the platform.

Effectiveness I evaluated through error and memorability indicators. By applying these where means are warnings and feedback's I have not been able to make the system give me any feedback or warnings, besides at the option where companies have not filled in all empty boxes. The level of memorability is very high due to transparency, giving the user a very strict possibility for activities therefore the “platform” is easy to manage and memorize. A source for improving this feature is a better knowledge of the user. The evaluation shows a low level of error indicators and a high level of memorability.

I evaluated satisfaction with the help of the satisfaction indicator. Through the evaluation of the platform I have not found an undo, edit or abort button that would enable the user to have somewhat of a control over the platform. I have not got the knowledge of any edit or undo button, where employers can choose to correct either abandon the submitted task. Nor do I have the knowledge of how this would be possible as the system has not got a user nor a password verified function where the user would get different privileges.
The satisfaction level is acceptable given that it is an intermediate platform, apart from the mailing functionality that requires another program instead of having a built-in mailing option on the web page. The rest of the page is static where the information flow is one-sided and does not have the ability to enable a relationship. The evaluation shows that there is no satisfaction regarding IT-based relationship enabling processes.

In this case, Linked Student shows that they have got knowledge of the users, being students and companies, they also show a rather good knowledge of the design while they totally lack the task. Their task is to link students with companies, therefore creating a platform that enables relationship-building processes for students and companies. When students apply for a task, they do not come in contact with the employer at all times. Tasks submitted by employers are edited and dealt with accordingly to ENS rules through their custom relation management system, making so users lose most of their rights over the data they submit. In order for students and companies to be linked they need to interact, to come in contact with each other and that is not possible through a static web page which Linked Student is at the time being.

An overall observation about the platform is that ENS seems not to have it in purpose at all to fulfill a relationship enabling process, as it craves too much work and the revealing of data about companies and organizations which they are entrusted with. The user experience is not being encouraged to enable any spiritual, aesthetic or intellectual development, presenting a very formal, strict and one-sided information sharing. The platform is static and at most times ENS is predominant as a middle person making it unable for students and companies to come in contact and form a relationship of any kind failing the aim of this study.

5. Design suggestion

In order to introduce a collaboration platform for students and companies a wider interaction is needed for users between each other and not mainly with the interface. In order to eliminate the existing disabilities, I present a design suggestion and introduce certain dynamic applications, via a mock-up of five images that will enable a fully functional platform. At this point there are three categories giving an overview for a clear understanding and reward to the user; to ease manageability, heighten the efficiency, effectiveness and satisfaction. Nevertheless besides usability there are other important quality attributes. For example, one that is worth naming regarding the subject is utility, which refers to the design functionality. When using a platform it all comes down if it is what
you want, otherwise it does not matter much if it is easy to use. Therefore an essential question is: Does it fulfill the users need?

Utility and usability go hand in hand and are equally important. Having access to high performing systems can still hinder the ability to accomplish tasks due to the difficult interface. I also believe that it is necessary to introduce web 2.0 properties to improve the user experience and enable possibilities to create relationships between students and companies. Last but not least important to consider is the impact a dynamic web page can have on the user compared to a static one.

In this section I introduce new criterion, definitions and argumentation to why they are essential in creating a relationship. As through my studies I have had courses like Interaction Design, Web 2.0 and some Dynamical systems studies, I gathered knowledge about how a users life can be altered towards the better. This can be done with a bit of regard to the looks of the website, with a bit of life as in meeting other people online, or even with a bit of smart technology having the feeling that there is somebody there; yet there is not. It is in fact a dynamical system that collaborates and communicates with you just as a living being through internet or by other means (atm machines). As I reckon the department has had very well grounded reasons why to teach us all three courses and not just two or one of them, therefore I see to it to stick to my domain and include them in my analyz.

5.1 Interfaces and Interaction Design

An interface is a bridge between users and the system, enhanced with a design to heighten the users experience. It is the first thing they meet in order to connect with the system. A good design of the interface is of high importance, as it got to meet users’ needs and it has to be easy to use. It is criterion encapsulating attributes that help encourage usability, because it does not interfere or distract the user, rather it helps users complete their goals. According to Nielsen(1993) a good user interface reduces costs involved in training and maintaining, makes users engage more, and therefore gives a higher satisfaction level to content users. To achieve a good interface there are some fundamental attributes to think of:

**Knowledge of your users:** Considering your users goals in order to accomplish them, being aware of their skills and needs can get you in position to deliver.

“When given the choice between obsessing over competitors or customers, always obsess over customers. Start with customers and work backward”, (Bezos, 2009),

**Patterns:** According to designers, patterns are important as most users spend a fraction of their days on different interfaces, like the universities website, Facebook, blogging or
paying their bills, therefore consider using familiar user interface patterns to help them feel at home. (Aspinall 2007, pp. 17-46)

**Consistency:** Language, layout and design need to be consistent in order to enable users to have better understanding of how things work and thus increasing their efficiency. Consistency is possible through standards throughout the whole interface (Nielsen, 1993).

“The more users' expectations prove right, the more they will feel in control of the system and the more they will like it.” (Nielsen 1993, p. 68)

**Visual hierarchy:** Through design you “can clearly communicate ideas through the organizing and manipulating of words and pictures.” (Veen 2001, p. 104) Choosing the right size, color and placement of elements working together, point out the most important things on an interface, showing a clear path towards the understanding of it.

**Interaction:** The interface is meant to communicate with the users at all times. Through statement message, or exceptions the system communicates to the users if the process is the right/wrong or in case misunderstanding has been encountered (Veen, 2001).

**Forgiving:** In case data is filled in wrong on a profile, or while posting on a forum something goes wrong, it is always good to have an undo button or an edit button in order to ensure possibilities for the user to correct their mistakes (Veen, 2001).

**Keep it simple and move forward:** Having a clean cut interface is having an invisible interface. The interface is meant to be understood and help the user, not to show a designers ego through stealing the show (Almqvist, 2000).

“A modern paradox is that it's simpler to create complex interfaces because it's so complex to simplify them.” (Almqvist 2000)

**Reward your users:** Shortcuts are a spice in the users experience as it makes the work flow become more efficient and it gives an empowering feeling from the developers side that you are now at a level where you learned so much that you can get a reward (Bezos, 2009).

Good web design beholds art and science, function and form, creativity and code, inspiration and measures “to fully exploit either, we’ll need to think about Web design in a much more dynamic way” (Veen 2001, p. 114). Categories like language, look, placement of the navigation bar and consistency of the implemented CSS (style sheet language) tabs are essential to increase a decent usability. Measuring up a satisfaction level based on quantitative research doesn't deliver anymore therefore system design applies for a
qualitative method just as my research does, the focus point being the design aspect of understanding peoples response to what the product is.

5.2 Dynamic systems and dynamical capabilities

The dynamical process is responsible for the development of systems, while dynamic design “encompasses behavior and interactivity”. (Veen, 2001, p.23)

“Dynamic capabilities are shaped by the co-evolution of learning mechanisms,” like: “(1) experience accumulation, (2) knowledge articulation and (3) knowledge codification processes”. (Zollo, 1999, p. 2)

Zollo(1999) means that for an increased performance integration, relatedness and practice are needed. Repeated practice helps people to understand processes, and to learn from minor failures (Sitkin, 1992) giving a higher probability to develop effective learning routines. By learning, one goes through a systematic method of modification (change), therefore learning is a dynamic capability. Teece (1997) and his colleagues define the concept of “dynamic capabilities” as an ability to adapt:

“ability to integrate, build and reconfigure internal and external competences to address rapidly changing environments”. (Teece, Pisano and Shuen 1997, p. 516)

Nielsen, on the other hand, states that dynamism is a secondary criterion that ensures and encourages interaction between users and the creation of communities (Nielsen, 2007).

“The idea of community, user generated content and more dynamic web pages are not inherently bad in the same way, they should be secondary to the primary things sites should get right.” (Nielsen, 2007)

The improved quality of web servers and browsers make it possible for developers to create functioning Java applets, advanced PHP, JavaScript and powerful database driven sites, whereas at this point we take advantage of dynamic applications with focus on functionality, not just content.

“Building effective and manageable Web sites today requires dynamic, page-generating tools.” (Veen, 2001, p 213)
It is not an easy job to distinguish design and programming as they work hand in hand; just as all components of the Web do. Therefore the creation of a database can heighten the quality a notch, “where knowledge must be shared and assessed” (Carlile, 2004, p 566).

The programming languages that we were taught, during the three years of systems development studies, stand as a middleware like, Java and PHP. Middleware that easily can query SQL databases for creating truly dynamic sites and they demand little maintenance. With the help of the middleware and the database the process of managing knowledge available on the web assures a “dynamic process out of which competitive advantage arises and then erodes over time” (Cockburn, Henderson and Stern, 2000, p 1123).

5.3 Web 2.0

According to Veen (2001), O’Reilly (2007), Nielsen (2007) and other authors Web 2.0 is a term for those applications that are not static any longer and that facilitate interactivity, information sharing, interoperability, emphasis on human interaction therefore usability and design through collaboration on the World Wide Web. The wow factor (“A set of properties belonging to an object that pleasantly surprise a watcher.”(Dictionary.com)) lays in applications that ensure an infrastructure for social interaction, more dynamic user participation, and collaboration. It also promotes and enables users with no programming skills to create their own blog, publish their ideas, create and upload video or audio files, share information and photos. Web 2.0 is a new way of thinking about the web, where tools and functions are at your hand to use exactly as in your own desktop environment, therefore it is seen as O’Reilly (2007, p. 17) describes it the “Web as Platform”. An example can be Google’s different platforms where you can either publish or privately work on your presentations, documents, pictures and so much more. It is users that add value to applications, such as Wikipedia, YouTube, FaceBook etc. by using them: “Participating and contributing in the practice of crowd-sourcing” describes Howe (2006).

According to Nielsen (2007) the defining elements for Web 2.0 are: Rich Internet Applications (RIA), Community features, social networks, user generated content, Mash-ups (using Google as a development platform), and Advertising.

5.4 Why do the above mentioned enable relationships?

Usability is a necessary condition for survival on the Internet, when thinking about how dissatisfaction of users affect websites, web shops, etc. In case it is difficult for students to understand and use a platform they will leave. If an organization does not manage to state clearly what services they offer and what use there is to visit their website, students will
leave. If they get lost during their search on the website and panic not finding the place they just been at five minutes ago, students will leave. In this case usability is relevant in order to make users stay.

Usability testing goes all the way back to Human Computer Interaction. When testing systems or any kind of programs certain criteria regarding how much the Web has accomplished not being just a software anymore are important to consider. Testing involves security of the user and their data, functionality of the system and all those things earlier mentioned about usability and more. The study of usability is to be approached mostly from a qualitative point of view. Involved are the users needs of accomplishing through the usage of a system, how users feel about using the system (if it encourages productivity), or the ability of the system to create a community. Measuring the level of usability is done in some measure through design. Design encourages interaction between users and systems and it adds quality to usability, therefore through a good design a platform can be understood. This promotes a good interaction between users of the platform as well, removing possible hangups with the system that the interaction can cause.

Stolterman (1991) writes about how methods will help you turn an idea into a visible image that can be tested and reflected over, if it was really what we wanted.

Regarding the form and the state of the platform, static websites can be too much of a hindrance, being a one sided information sharing process, therefore turning to a dynamic way of publishing information is the optimal choice to improve the user experience. This can be done through using a database which allows the publishing of the content faster, and the change of design and formats more efficient. None the less it makes your site come alive, which encourage relationship-building that static websites lack. Static websites give the feeling of hitting a brick wall, besides it is a hassle to create a relationship based on e-mails. On the other hand dynamic websites present users a welcoming environment where they can see and feel each others presence, as well as they can see the environment and use the platforms functions to interact, through which creating relationships and/or communities that heightens the user experience. Relationships involve a transformation of knowledge which does not require “static balance, but a dynamic one.” (Brown & Duguid, 2001, pp. 208) — where differentiation is made between what is known and what is novel to generate a practical and purposeful change.

Web 2.0 in this case is an essential property of our platform regarding how well a community can be established, if there is a possibility to create a social network and on which level. Furthermore, it would encourage the usage of mash-ups regarding those users that do not have a personal website, everybody would have a personal site where they are
able to create their own personal presentation and sharing of information, pictures or such, at the same time it can promote different events though advertisement.

5.4.1 Social science through technology enabled relationships

Relationships can be based on mutual respect, interest and warmth that bring people together which is a state, a sensation and quality. According to Dictionary.com warmth can mean, glowing effect produced by heat as a process of energy, the use of warm colors, intense emotion, friendliness, kindness or affection. With other words a state where you feel at ease and comfortable.

Synonyms of warmth are defined in several ways on Thesaurus.com: Excitement, hospitality, heat, good feeling, strong fondness, enthusiasm, convenience, friendliness, sociability, determination, seriousness and mental state. These properties awaken a state of mind, a feeling and a perception that gives quality to a web site or any type of interface, making users content and creating a welcoming atmosphere and increasing the user experience.

Usability and Web 2.0 have been presented previously, stating mainly that there is a first impression. Users leave if the system is not easily manageable and efficient, they even leave if the design of the interface lacks the ability to communicate something of interest in a visually pleasant, consistent manner. Furthermore, time has limited static websites, making dynamic capabilities accomplish such a level of interaction that can easily carry out the sharing of ideas, information, knowledge, programs etc. giving IT value. I approach this study in a manner that the engagement of usability creating a high user experience, and web 2.0 representing socializing, will bring forth a feeling in my perspective of the properties warmth stands for.

Studies of social science tell that warmth is highly valued by most people, and that healthy relationships show emotional warmth. (Updegraff & Suh, 2007) In my opinion warmth means being alive, it means hope and friendliness.

“In Sweden, the failure of education in the humanities ill-equips managers and leaders to understand the malaise of a distorted motion of self-fulfillment. Well educated in engineering few of the managers i met at Volvo are familiar with either the Bible or Scandinavian classics such as Peer Gynt. The progressive spirit has led Sweden in a direction of material progress and political democracy at the expense of the individual's spiritual, aesthetic, and intellectual development. In the march toward a consumer, both community and the inner life are being lost.”(Sennett, 1998, p.233)
This quotation expresses how everybody looks out for themselves, disregarding spiritual, aesthetic and intellectual development. Already during university studies a good grade is decisive, disregarding collaboration with other faculties and institutions. This experience once graduating follows an individual, experiencing that signing a contract, closing up a deal or getting a raise is what most look forward to, while “community and inner life are being lost”. A dynamic platform encourages information exchange not only in between computers and humans, but in between human to human interaction as well, making it possible to learn from one another and grow as an individual. In order to establish a community overseas, technology is a medium that becomes invisible if working right, therefor it is up to the users to have an inner glow, show compassion/warmth and interest.

5.5 Design proposal

I propose to extend the abilities of the Linked Student platform and adjust it to suit the needs of students and companies by enabling relationship building processes. By adding interaction, information sharing, collaboration, enabling of users, new tools and functions to the platform I aim to bring the platform in to the information age and fulfill the purpose of the study. In the first page, as shown in figure 7, I introduce a logical sequence of the path from Umeå University’s web page. Accessing the Intro through Samverkan making it more memorable. It also contains a clear overview of the platform being able to skip parts. The presented movie creates a more personal and dynamic feeling bringing together students, companies and the universities staff while it shortly relates and explains the tools and availabilities of the platform.

![Figure 7. Introduction - Design suggestion](image-url)
Figure 8 is formed similarly to the first page being consistent while it presents a search engine, a tool that presents students with available thesis, project, events etc. It also enables companies to look up what student unions or the university is publishing in case they would like to participate. Therefore this tool as well is promoting a relationship building behavior between students and companies collaborating with the university. If you look closer at the search engine you can observe that there are certain categories that are gray, which means that those do not exist in the database at the time being. You can also observe that it is a search engine and nothing more, although in case you find the task most suited to your desire when clicking on the link you either come to the employers profile in case the company or organization does not own a web site of their own, or to their personal website where they have the announcement. In case you come to the profile of this certain employer who added the task you can access the task description and either choose to Skype them in the hours available made by them, call them or e-mail them through a built in mailing system that is incorporated in the system. As every user is logged in with their CAS users it is not required to enter more personal data in order to be contacted by the employer, giving them the privilege to be able to access your profile in order to see your CV and portfolio. Introducing the identification and profile functions are in order to improve the effectiveness of the user.
To make it more understandable why there is no add, edit or undo button on this specific page I will be able to explain by going further to figure 9 where a Profile of a user is presented.

The user profile presented in figure 9 belongs to a student, therefore the categories are “Presentation”, “Portfolio” and “Kontakt”. In case it would belong to a company or to the university unions/personal it would stand “Presentation”, “Tasks” and “Kontakt” enabling the user to manage their own profiles accordingly to their desires. The option to have the skype-me and mail-me technicalities included in the system improves the effectiveness and heightens the satisfaction as the user needs to have only one website running, not necessitating any other programs to fill in for the platform in order to achieve its full functionality. The Skype-me option is open only at the times decided by the user of the profile. In case students do not own the money to be able to call, yet they would still want to have a live conversation with the company being afraid not to be misunderstood in a written form, they can use this option. The mail-me option is mostly for those students who have got a hard time taking up a live discussion, yet are very handy at coming through in a written form. At this point we have got a dynamic system making the user experience efficient, effective and satisfactory.
Shortly about the Profile category: it is for users to introduce themselves, publishing a picture and making their achievements available under “Portfolio” that can be controlled to who sees it, and who does not, through profile privacy settings. It is also possible to modify information that is placed on the profile. Accessing “Kontakt”; Skype me and mail me is available. Two tools are integrated within the profile that enable users to contact others right away from the platform, either in a formal form, either through a live communicating form. In case the user has got it's Skype turned off (not being available), which is mostly encountered with companies or the university staff an Error message will show, that it is not possible to Skype the person at that time.

Figure 10 introduces possibilities to establish communities (web 2.0) through interaction in two different ways. The first, presenting a wall with forums and threads encouraging professionalism having formal qualities. Second, it is a chat application being presented which promotes a free and playful open conversation, where users can choose their nick names, domain and can either chat in a community or privately, sharing their information and giving the platform a value. These two different applications introduce possibilities to produce reward opportunities for users giving higher efficiency. The wall is more forgiving when mistakes occur yet both applications achieve the properties of Web 2.0 and present dynamic functionality.

Colors are being introduced, and by uniting everybody in a dynamical and interactive environment friendliness is achieved, therefore aspects of warmth from social science are present. According to the stated earlier in chapter 3 in order to establish a well functioning community/relationship one needs to be alive, to have an inner glow, show compassion, warmth, mutual respect and interest.

Also the sharing of information and engaging the user produce enthusiasm whereas uniting students, companies and professors therefore attachment is being promoted.
In my opinion, the additional functions I added, through my design suggestion, improve efficiency, effectiveness, satisfaction and add to the user experience with the additional dynamical capabilities and web 2.0 capabilities. These properties enable users and make so that the platform takes over the workload ENS has got to do, while the relationship building process becomes more important the platform becoming the intermediate instead of ENS. These changes abolish the existing walls created in between students and companies making so that ENS will not be a bridge linking the two worlds together, but that the platform opens up a whole high way for users to use as they desire.
6. Conclusions

The objective of this paper was to find out if there is a suitable way to narrow the distance between companies and students with help of IT. To reach my objective I conducted a pilot study, an expert evaluation and a design suggestion.

The contribution of the study is threefold:

1. The pilot study proves the existence of a demand from both students and companies for more often encounters and interaction between one another.
2. The expert evaluation shows that the platform is used as a tool for ENS to retrieve and send information. ENS becomes a dealer and the platform takes up and intermediating role instead of enabling relationships.
3. My design proposal aims to make use of IT so it serves as the medium through which relationships are established.

An overall conclusion is that LinkedStudent does promote users to collaborate, although its static property does not enable users to come in contact or create relationships.

Businesses run on conversations of sales and services. When a user loads a website it has to be functional, simple, efficient and the majority needs to convert into sale, therefore the design of the interfaces and the dynamic capabilities of the web page all add to a higher user experience. Using the available tools in the design suggestion, users are enabled to create and maintain their own chances to a better future. The process of placing knowledge in practice, giving students more freedom to evolve as an individual, enabling them to take contact and be followed by companies becomes of focus. Profiles accomplish so users can follow up on each others activities, achievements, projects, future plans, creating a state of involvement and interest. Taking contact becomes easier through the different communities, therefore the relationship building process is more fluent and can easily be achieved.

Through this process, technology-enabled relationships can increase the employment possibility for students, and heighten the chances for companies of employing qualified graduates.
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