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Success factors in the process of establishing a TechCenter

Within a Swedish academic organization such as an IT-University with limited
hardware and economic resources.

PETER CARLSSON
TOR FAXÉN
MARKUS HANSSON



CHALMERS



UNIVERSITY OF GOTHENBURG

IT University of Göteborg
Chalmers University of Technology and University of Gothenburg
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ABSTRAKT

Denna uppsats beskriver möjliga framgångsfaktorer vid etablering av ett TechCenter. Den ger också ett förslag på en definition av vad ett TechCenter är, dess funktion som en del av ett IT-Universitet och myntar begreppet TechCenter. Success factors tas fram genom analyser av intervjuer och frågeformulär, som besvarats av människor viktiga för TechCenter projektet vid IT-Universitet i Göteborg. Dessa inkluderar fakulteten, privata företags akademiska initiativ och organisationer liknande TechCenter-projektet. Denna uppsats kan också användas som inspiration till andra Universitet som planerar för att skapa ett TechCenter.

What is the success factors when establishing a TechCenter? This thesis describes the possible success factors when establishing a TechCenter within a IT-University in Gothenburg, Sweden. This thesis also describes a possible definition of what a TechCenter is, its purpose as a department in an organization and introduces the term TechCenter as a neologism. The success factors are established through analysis of a set interviews and also through the use of questionnaires. The empirical data from these include people important to the TechCenter project at the IT-University in Gothenburg, including the faculty, academic initiatives from private corporations and staff from organizations similar to TechCenter project. This thesis could also be used as inspiration to other Universities planning to create a TechCenter.

Keywords:

Technology Center, TechCenter, TC, success factors, IT-University, open lab environment, sub-organization, academic organization

1. INTRODUCTION

The definition of a “TechCenter” or “Technology Center” differs depending on where it is established. It is mostly referred to as a “Center Construct” supporting a institution such as Universities or Organizations that are in need of a supporting center. In our case we focus on the “TECH” and identify this as a center solution for massive hardware and software support for the hosting organization. The development of a “Technology Center” requires a structure consisting of machines, personnel, and goals that are congruent with the objectives of the host organization. There are some documentation today which confirm this way to set it up, a lot of them differ from what kind of structure it's built on and a new concept has emerged called a “TechCenter”. When referring to a TechCenter the term/buzzword or phenomenon doesn't stand clearly what it has to offer, a lot of companies and other universities from USA usually points out their computer lab as their TC when in fact that it's just what it is, a room with computers. TC's often provide something more than just a architectural platform for IT, it will likely have courses and openings work opportunities for students or companies/partners, a TC is often noticed as a growing organization within the organization itself. This is what Temple University refer to as their TechCenter:

“The Temple University TECH (Teaching, Education, Collaboration and Help) Center is a 75,000-square-ft., state-of-the-art technology facility with resources that cater to current student learning styles. Designed with a variety of workspaces to enable students to work collaboratively or individually, the Center is the largest of its kind in the US. This dynamic facility allows students to meet, study, collaborate, relax, and take advantage of many technology resources.

*We do not provide classroom space or credited courses or programs of study in our TECH Center.” (2008, 27 may) Temple University TechCenter
<http://www.temple.edu/cs/techcenter/>*

This seemed strange to us that they don't provide courses and don't have some sort of student-partner relation. But then again it was not one of their goals.

Question for our thesis:

“What are the success factors when establishing a Tech Center at a IT-University in Sweden?”

So why is this interesting? First of all when defined what a TechCenter means it's more interesting to see how it is established. It is even more interesting to see why this definition isn't used in Sweden when there is in fact institutions and departments that work like a Center Construct like a TechCenter.

The TechCenter at Temple University gave us a different view of what a TechCenter would look like in a Swedish Academic organization. We did get a clear vision from what they said:

We asked them what kind of competencies/capabilities a TechCenter need?

“Depends on the mission of your TechCenter. At our TechCenter, we have staff who provide:

- 1. Technical infrastructure support*
- 2. Operational support*
- 3. Media systems support*
- 4. Technical consulting support*

However they did not have clear success factors or goals to offer us. But they showed us is that they are a supporting technical infrastructure for a University. They support the client based structure and some software, they did not offer courses or held University courses at their facilities. We will discuss this with a comparison to Chalmers ITS later on in this thesis.

1.1 Purpose of Our Thesis

The purpose of our thesis is to explore the concept of an academic technology center, "TechCenter" and identify the challenges that a University faces when establishing a center of this construction. Our focus with this bachelor thesis is to identify what the success factors are when establishing a TC in a Swedish University that is educating students in IT. We will analyze this at the IT-University of Gothenburg. To accomplish this we need to find who could make benefits out of the TC and interview them. We will also find similar organizations and find out how they have established a TC and gain their perspective/competence. This thesis will also refer to the laws of running a TC within universities in Sweden, because it also differs from TC's in other Universities in the USA. As a source for American TC's we will analyze the construct at the Temple University's TechCenter. Our research will also be supported by the current partners of the TC at the IT-University of Gothenburg such as SUN and IBM, How are their views and goals for this center construct. With this analysis we hope to establish a understanding for the word "TechCenter" and a framework for how to establish such a construction in the Swedish academic world where IT is the source for competence and education.

1.2 Background

The "TechCenter" initiative in Gothenburg was started by William Sullivan, a Senior Lecturer at IT-University, because he saw a need for more technology in the education. He started by establishing contacts with hardware, software vendors, consulting firms and their academic initiatives to get their support. He also started to get students and faculty involved with the TC in order to advance the project further. It soon became apparent that the TC had a lot of potential and that it was a great need for the services it could produce. Over time, the mission of the TC had expanded and has now been clarified.

1.3 The IT-University's TechCenter mission statement

Creating an organization/department in the IT-University of Gothenburg that can provide the students access to advanced technologies and platforms that they would otherwise not been able to work with, in order to improve the depth of the knowledge during their education.

- Support student projects with access to technology they would not be able to access on their own.
- Support student dissertation and University research.
- Support professors and lecturers with access to technologies that would help them to improve education and research.
- Improve partnerships and collaboration with private and government organizations and institutions.
- Strengthen the reputation of the IT-University internationally and attract more students.

1.4 The TechCenter's achievements so far

For the moment they have established partnerships with several larger hardware and software vendors such as IBM, Unisys, Sun, Microsoft and VMware. They have been working with IBM to become a technology hub for their academic initiative. They have installed and configured a System i 570 mainframe from IBM to use as a platform for IBM Technologies and created a pre-certification for basic administration on I5/OS.

They also have several Sun enterprise 4500 servers used to support various databases and Unisys has also expressed an interest in supporting them with a large server. So far the TC has already created three pre-certification courses for the students. The first is in C# development, the second is in Java development and the third one is for I5/OS. These courses have attracted close to 200 students without marketing. They are among the most popular courses at the IT-University.

2. THEORY

2.1 Institutions and departments that acts like a TechCenter

The problem that occurred for us in the beginning of this thesis is that we couldn't relate our work to other written papers. This is how we built up our theoretical framework.

A TC is usually a common center for technical solutions located in companies and Universities mostly in USA, one of the most well known is the TC at the Temple University, Pennsylvania. We had to make this TC definable and recognizable. Organizations had used many different methods to define a operational definition of a TC. One of those methods is through defining it's success factors. A successful TC should have the effective support of the faculty, students and alumni. IT can also be used to attract new students to different programs. Examples from other existing TC's who are working successfully are mainly based in USA, in Universities such as the one in the Temple University in Pennsylvania. The differences between a University-based TC and a company-based TC are similar to the differences between a company and a University. Companies usually produce products or services and Universities focus on education and research. Therefore the TC located in the IT-University will not be compared to TC's in organizations such as Volvo IT(1). Volvo IT could be viewed as a TC within a organization that produce IT solutions and training for their personnel.

(1) Volvo Information Technology Volvo AB is a fully owned subsidiary of AB Volvo. The company was created in 1967 with roots back in the punch card machine in the 1920. Volvo IT provides services within all areas of IT in the industrial process, Life cycle management, SAP solutions and IT operations. Volvo provides IT services for VCC (Volvo cars corp.) globally and other large industrial companies. Volvo IT have offices residing in Sweden, Belgium, Great Britain USA and India.

2.1.1 Chalmers Technical University

The Chalmers University often claims to be a center for Technology, the name Chalmers Technical University defines it as one of the best Universities in Sweden when it comes to Technology. As any other University they provide a broad variety of courses/programs and student-partner relation (Chalmers student union). Their view of themselves and what they announce to the public is that they have the better ability to provide students with different platforms to develop on. Medicine, Math or Programming are among those majors these platforms are used for and accordingly to Sara Ekström (IT-Service change manager) the platforms provided are mac/osx, pc/windows and sun/solaris machines.

If other platforms are needed it's up to the institution to provide that for their students. A good example is our study of the IT-University which is a institution in Göteborgs Universitet (GU) and have Chalmers IT-Service (ITS) as their technical provider. Chalmers also have their innovation strategy called "Chalmers Innovation" where students and partners can meet and share ideas which later on can lead to recruitment. Primary partners as their hardware vendors are Dell, HP and SAMSUNG, they can provide a broad assortment of client based computers and optional equipment.



Figure 1: Main Entré at Johanneberg.

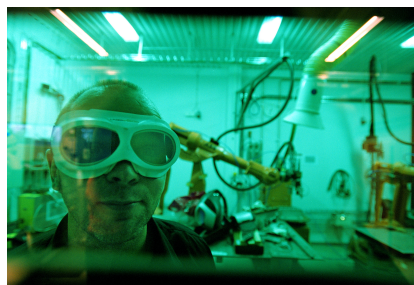


Figure 2: The industrial robotics departement.



Figure 3: Bridge simulation departement.

2.1.2 Center För Affärssystem (HANDELS/GU)

The Center För Affärssystem (CFA) is a department within Handels Business-school of GU. Their main objective is to teach and provide “business enterprise systems” to their students. They have partners like Microsoft, Hogia, Jeeves, Garp etc. These partners provide course material, software and consulting on managing these business-enterprise systems. CFA has the ability to provide students with platforms they can collaborate on. In this case, when working in the field of economics. This is something that most other Universities can't provide. Trying to relate this department to others of it's kind in Gothenburg, none really stands out this clearly by educating students in business information systems on different platforms.

When observing this organization it stands out as a TC for business intelligence. CFA provides remote access to their platforms to anyone participating in student coursework as long as it is a school providing academic points. Many other Universities have been taking the opportunity to work on their platforms for ex IT-University, Chalmers have been using the remote access and the virtual PC environment to elaborate with business intelligence. CFA's lab consist of one room with 30 seats, 16 laptops and 2 projectors.



Figure 4: Main Office at CFA



Figure 5: The lab in use of Chalmers students.

2.1.3 Temple University's Tech Center

The Temple University of Pennsylvania is one of those Universities that stands out in the world for being “the” TechCenter. Their idea of a TC is:

- A student computer center with 700 computers: up to 600 fixed workstations and 100 wireless loaner laptops.
- Temple's Welcome Center, a 4,260-ft. facility to host University visits by prospective students.
- 13 breakout rooms for collaboration and group study.
- A 24-hour Help Desk for students, faculty, and staff.
- Specialized labs including video editing, graphic design, music composition, “quiet” zone, and advanced technology lab.
- A Faculty Wing including resources such as the Teaching and Learning Center and the Instructional Support Center.
- Social space for students with lounge areas and plasma TVs.
- A Starbucks Café serving coffee and light refreshments.

The general lab areas, subdivided by different colors, offer PC and Macintosh workstations, with local print stations, popular software, free music feeds, and cable television streams to each computer desktop.

It appears that end-user entertainment is a significant part of their mission and this is definitely not what the TC at the IT-University is trying to achieve. They also clearly promote their TC as the main platform choice for their students to develop in. The platforms of choice are mainly client based such as a laptops, the option of developing in different server platforms isn't available. But the lack of server platforms here counters their facilities when creativity is the main selling concept of this University.



Figure 6: General computer lab.



Figure 7: The Lounge.

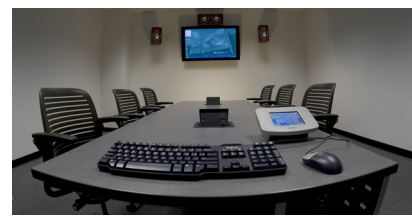


Figure 8: Conference room.

3. METHODS

3.1 Choice of Methods

The TC at the IT-University is newly established and personnel varies from Assistant Professors to students. The choice of methods will have to be simple and straightforward, complicated methods would most likely result in odd exceptions and unfinished calculations. We cannot analyze the TC based on what it will become, but analyze it as it were in the current state. The most usual approach of analyzing is the usage of qualitative or quantitative methods like observations or interviews.(Backman, 2007)

Quantitative methods are used to gather data through different types of techniques. And then use them to gather as much information as possible, while qualitative methods are used to gather rich and unstructured data that are later being used to prove a theory. The course of this study will follow either an inductive or deductive approach. Inductive approaches have theories that are created through the gathered material. In deductive approaches the researcher have created a theory or a hypothesis before the gathering of data has begun, and the aim is to strengthen that theory or hypothesis.

The methods for our bachelor thesis were qualitative methods since the data that we gathered to form our success factors were very rich and unstructured. We had to know the interviewed peoples personal opinions and also their experiences with the TC at the IT-University. Since there are no existing theories of how a TC should be built we cannot follow a deductive approach. The course of this study were instead to follow an inductive approach were we can formulate our own theory. In this case our theory was the success factors and they will be based on the results we will get from our methods.

The type of methods that we used was interviews and questionnaires. We questioned people that were affected by the TC in many different ways. This people were the TC's related partners and the staff at the IT-University. These success factors was established by the partners demands and requests that the TC should have provided.

3.2 Analysis of data

- *Critical Success Factors = Success Factors are proven to be critical in a creation of a success plan is proven by research and analysis.*
- *Success Factors = Success Factors that aren't yet proven by research and analysis.*

The originated theory is that a Success factor is a business term for an element which is necessary for an organization or project to achieve it's goal.(Ronald, 1961)

The forming of our success factors originated from that term, however, our success factors cannot be “critical” since we can't define them as final factors based on other organizations similar to the TC, nor could we use others organizations that call themselves “TechCenters” as an argument to call our success factors “critical”. There are few organizations with a TC, similar to the TC at the IT-University that supports the same success factors. Therefore we can't find out “critical” success factors for the TC, but we can find out what it's success factors would be. Therefore our final statements became the success factors.

This business term was later refined and we will take those statements in consideration when creating our success factors. While we will not heed to deep into the term it could be worth mentioning the four prime sources of the critical success factors:

(The List) (Rockart, 1979)

1. Structure of the particular industry – Success factors that are determined by the characteristics of the industry itself.
2. Competitive strategy, industry position and geographic location.
Depending on the scale and location of the company the success factors will differ very much. In small companies the company's goal is often a CSF. For example, IBM's competitive approach to the marketing of small, inexpensive computers is, in itself, a CSF for all minicomputer manufacturers. IBM has developed a set of services and a framework to help electronics manufacturers plan for and manage potential disruptions, and stay ahead of the curve in critical areas. (Global Services, 2005)
3. Environmental Factors - Environmental success factors have become a more important factor nowadays, for example with companies such as energy suppliers.
4. Temporal Factors - These are areas of activity that are significant for the success of an organization for a particular period of time.

We are interested in finding out more about The Success factor, structure of the particular industry.

We summarized the results from our qualitative interviews into our inductive theory, the success factors.

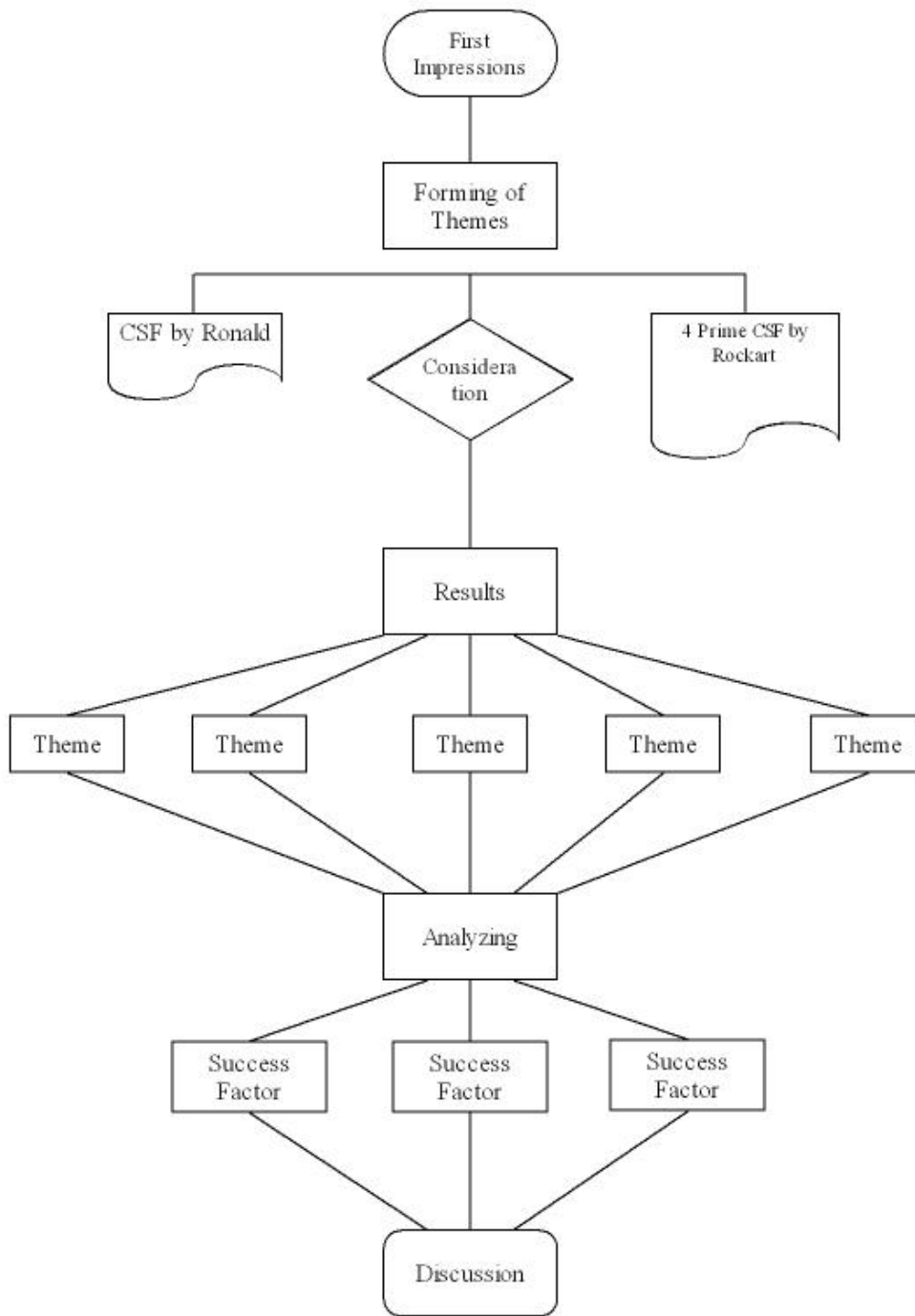


Figure 9: The approach that we had during our bachelor thesis

3.3 The Creation

Right now the TC is a part of the IT-University and can be defined as a growing organization and it is of now not decided what type of organization it will be. The TC have to face all the challenges newly formed organization does such as economy, marketing etc. If successful the TC can choose what type of organization it should be.

Temple University state's what else is needed except resources for managing a Tech Center:

1. A strong strategic plan.
2. Support from Executive management
3. Feedback from all academic units in the planning of the center
4. Appropriately-trained staff
5. A good outreach program

3.4 Selection

We choose not to analyze any further. The purpose from the beginning was to interview someone from the USA and compare their TC with the TC at the IT-University. However it would not be possible without an observation, which could not be performed due to our time constraints. One problem was to analyze the TC from the view of a normal organization and not an organization within a Swedish University, and from that make out our success factors. Most of the people we interviewed answered information that were sensitive, because they contained questions about the policy and management of their company. If we had many steering or leading questions the person might have chosen not to reply to them because he couldn't represent the entire organizations view. Therefore we couldn't continue into this subject, but instead have an unbiased point of view during the thesis.themes

3.5 Material

Questionnaires are well-established techniques for collecting data and users opinions. They are very similar to interviews.

3.5.1 Description of companies in the study

SUN

- Kent Åberg – SUN Business Development Manager

SUN's Academic Initiative provides the TC with Courses, course material and certifications. They also provide open-source software which makes them a vital part in the TC's technical structure. We had a telephone interview with the Business development manager at the academic initiative for education and research in central and northern Europe.

IBM

- Anders Radlund – IBM Business Development Specialist

IBM provides certification courses for the TC in the iSeries platform with support-contract and is a major supplier of hardware at the IT-University's TC. For example providing IT-University with Thinkpad Laptops. We sent a questionnaire to IBM Nordic Business Development Specialist.

Chalmers

- Chalmers: Sara Ekström – Change Manager

Chalmers doesn't have a great impact on the TC now, but thanks to the TC's hardware, people at Chalmers are getting interested in using that technology that the TC has to offer. Chalmers will instead be used as comparison in the discussion to weight our successfactors against similar sub-organizations in Universities that acts like a TC. We contacted the Information Technology Service Change Manager at Chalmers and sent a questionnaire. The cooperations between Chalmers and GU have a great importance for the IT-University so it would be preferred that the TC would have that as well. If the TC would manage to establish a great connection with Chalmers, that would have a positive effect on IT-University's cooperation with Chalmers.

CFA

- CFA: Urban Ask – Director

We had an interview with Urban Ask in his office. CFA doesn't have any impact on the TC at the IT-University at all. But some courses usually runs at the IT-University for “business enterprise system learning”, something that the TC should provide in the future.

Temple University

- Temple University: Tim O'rourke and Gerald Hinkle – CEO

The CEO's answered our questions by e-mail, the same questionnaire we used to question the other Heads of TCs. We chosed Temple University as one of our references because of their advertisement of their name.

3.5.2 The Faculty at the IT-University

- Lennart Petersson – Assistant Professor
- Kari Wahll – Assistant Professor / Responsible for student registrations
- Kjell Engberg – Assistant Professor / Program coordinator
- Helena Holmström – Assistant Professor / SEM Program coordinator
- Urban Nulden – Senior Lecturer / Vice Dean / Chief of the TC

We interviewed the faculty at the IT-University to find out what their expectations were with the TC, with this information we could form our success factors. At the same time, these people had important knowledge of how the TC have performed during its time at IT-University. This is a challenge that all new independent sub-organizations at Universities or greater organizations will face. There is of great importance that a sub-organization must be accepted by the people in the main organization, there must be no great factors of conflict that would make work at sub-organization harder.

“Each company in an industry is in an individual situation determined by its history and current competitive strategy. For smaller organizations within an industry dominated by one or two large companies, the actions of the major companies will often produce new and significant problems for the smaller companies.”(Rockart, 1979)

3.6 Questionnaire

The people who received the questionnaires (Appendix 1, 2008) also received a small explanation about the TC at the IT-University (Appendix 2, 2008) so they could understand what the questionnaire was about. This is usually called a “missive”. The missive consisted of a scaled down version that we have in our introduction of our bachelor thesis:

- The TC's mission statement.
- The achievements that the TC made so far.
- What the purpose of our thesis was.

The questions in our interviews and questionnaires were formed by two aspects.

Standardisation: How much responsibility that are handed to the interviewed through the shape and placements of the questions.

Structuring: How much the interviewed are allowed to interpret freely on asked questions.

The goal with our qualitative interviews is to discover and find out qualities and the nature of our specified problem area. In this case to seek out the success factors.

We wanted in our questionnaires to give the interviewed freedom to say what they feel about the TC since our research course was inductive research we shouldn't have a low grade of standardization in our questions. They cannot be formed from something that we could have expected in our theories for our results. And therefore the structuring were to be quite high, we still wanted the interviewed person to answer our questions in a specific order, otherwise, it would be very hard to form any success factors from our results from the TC's partners if they all differed.

We then followed a recommended assortment of questions after a specific question form handed together from Assistant Professor Magnus Bergquist at IT-University. He recommends six different types of questions:

- **Open questions:** Questions that will generate results that can be expanded.
- **Probing Questions:** Small questions used to find out a deeper answer from the interviewed.
- **Hypothetic questions:** Questions where you place the interviewed in a specific situation and let him describe alternate responses or attitudes.
- **Steering questions:** Big questions with story and backgrounds described to the interviewed.
- **Leading questions:** Questions asked so the interviewed has to take a stand by either agree or react against.
- **Closed questions:** Yes/No questions.

These different types of questions had to be taken with careful consideration. Too many steering or leading questions would likely made the interviewed feel interrogated. Therefore the types of questions we mostly used was open and hypothetic questions. The questions will be structured in a specific order to help us analyze the specified problem area. To help us analyze we broke up the TC as a problem area into five parts. These parts could be called themes and will help us analyze the different perspectives of the TC.

3.7 Questions by themes

TechCenter

The part with low standardization, overviewing questions about what the partners know about the TC and what they expect the TC to deliver.

Actors

If we are able to form generalized success factors that can be used in other sub-organizations in an academic organization we had to know more about how the different actors work. Questions about the partners people who are working with the TC. If we are to be able to form generalized Success Factors that can be used by other sub-organizations, we have to know more about how different actors are working.

Options

How the partners are working with students by contacting the TC. Additional questions that mostly had to do with how the partners are working with students. These questions are interesting since the partners probably have very different ways of reaching out to students at Universities.

Success Factors

Straight questions that will help us form the success factors, however, these questions are not easy for a partner to answer, so the answers from them will require a lot of analysis.

Laws and Rules

Questions about the law and rules that are affecting the TC. If the TC would have been in another country such as in the USA, it would have been affected completely by different terms and rules. This specified problem area would differ when we were talking with partners and when we were talking with the sub-organizations that was similar to the TC. To get a similar result from the sub-organizations we interviewed, the questions was kept by the same construction by themes as for the TC partners. However, the questions themselves differed a little to better suit the partners we interviewed. In the end, we hoped to find out similar factors that we could form as success factors.

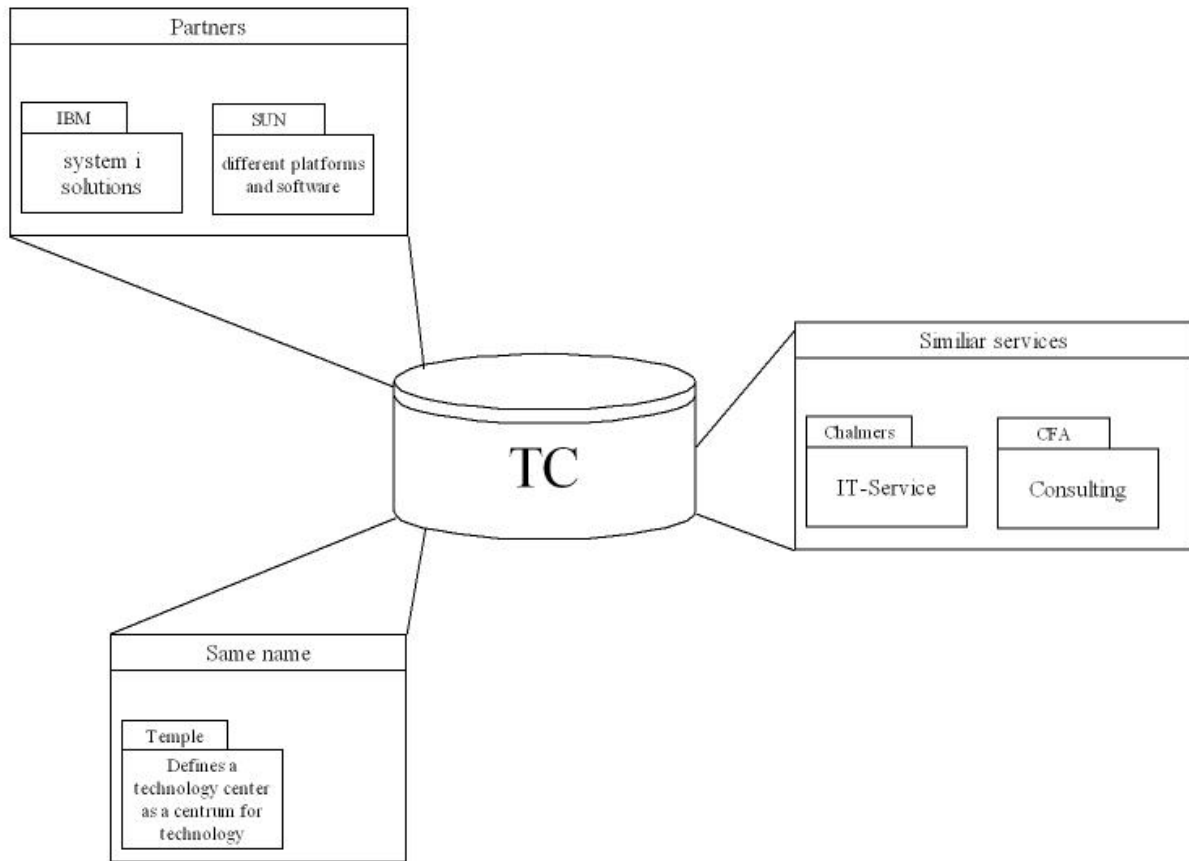


Figure 10: How the TC are affected by the different parties included in our bachelor thesis



Figure 11: iSeries 570 Mainframe



Figure 12: SUN Enterprise Servers



Figure 13: Student Server Cluster

4. RESULTS

This is the results of what we have been able to find out through interviews and questionnaire of the faculty, academic initiatives and organizations similar to the TechCenter. We have divided the result in problem areas and success factors.

4.1 Overview of problem areas

We have grouped the problems that we found during our survey into what we consider our most prominent problem areas.

4.1.1 The TC-project

IT is important to have a clear strategy for organizing partnerships. When the number of partners increase, the work must be more organized or you may end up losing partners, for example through problematic communications.

The public view of the TC project is also important, because if there is a lot of negative press about the TC, there is a chance that the entire project might get a bad reputation which could also harm the reputation of the University. This might make it harder to get government funding, vendor sponsoring or attract students.

4.1.2 University administration

Support from the University is another important part of the TC project. Before the project is started it is important to make sure that the faculty has been informed. If they are not fully aware of, or personally involved in the project it could lead to conflict of interests among other things.

4.1.3 Regulation and financial support

One area that is important to check before the TC project is started is the laws, regulation and bureaucracy from the government and the University that will affect the TC. If this is not properly researched there will be problems during the project that could have easily been avoided.

4.1.4 Hardware/Software vendor communication

It's also important to establish good communication between the hardware and software vendors. They will understand that the support that they normally give to the customers might be inadequate to the TC. If they not actively supporting the project relating to their system there is a chance that the students will lose interest and the project will be stalled or abandoned.

4.1.5 Infrastructure related problems

Making sure that there is proper facilities available for the TC is especially important if you are going to house large amounts of computer hardware. If large hardware vendors are willing to support the TC project with their hardware it's also important to insure them that you can handle it professionally.

Solving issues surrounding the infrastructure is important if the project is to be successful and there won't be any severe delays during the project phase.

We have chosen to categorize the Infrastructure related problems for the TC project as security issues, communication issues(fiber ip-phone), office space, servers and storage areas, because we saw them as most important.

Security issues

Important issues to consider is physical access: Who can get access to the server rooms and how access is managed. Another issue is data security, how to handle backups properly so that valuable data isn't lost or stolen and also access and administration management.

Communication

Securing stable high-speed Internet connection is obviously important and also to have good relation with the ISP so that they are aware of the activities of the TC. Another thing to consider is also what type of communication infrastructure that are needed for the TC.

Suitable facilities

The most important aspect of the facilities issue is the server room, it would hold the most valuable part of the infrastructure. Securing and building a proper server room is very important and must be done as soon as possible in the project. Important aspects of the server room includes the right type of fire fighting system, cable management, room access, electricity, cooling and more.

Human resource related problems

One of the biggest problems facing a TC project is that the students that are a vital part of it, will not be there for very long. Which means that the administrative systems must be designed to handle an organization where the key personal is only available for a short time. This is complicated and must be thoroughly examined during the project planning phase of the project.

Most of the students are also young adults without experience of working in project groups which must be respected and understood by the TC staff. It also means that in order for the project to be successful, understanding the key personal is important.

Because most of the work by students is driven by their interests and goals it's essential to keep the students interested. This is also an issue for the vendors because if their support is ineffective the students might loose interest and move to something else. Especially since the students are new to the vendors technology and thus have no commitments, they can easily choose to switch technology. Coordinating the effort to keep students interested and the TC working is a problem for the TC staff and the Vendors supporting the TC.

4.2 Forming of Success Factors

After we identified the problem area we summarized the answers we got from our questionnaires and interviews. We found similarities in the answers that helped us see the characteristics of a TC. From this we formed our success factors:

4.2.1 TechCenter as a lab environment

One of the success factors that Kent Åberg mentions, is to establish the TC as an open lab environment. Open to the students to experiment and explore hardware and software from different vendors in a way that would be impossible in most production systems. He is a business development manager at SUN and had the following to say about lab environments at a TC.

"I think I would like to see TechCenter as a lab environment or center environment, where people can go and do explorative work on ideas or find out or try out new technologies and so on. To bring in partners if they have some form of platform they want to share or whatever."

"My view of school environments is that they should not limit themselves to only look into one platform."

"Its key that people in school environments that they are allowed to try out various technologies."

"And also important is that in this environment its, todays implementation of technology thats a sealer and if you are an engineer that type of implementation, that type of implementation should make sure that you get the spirit to challenge todays implementations."

"If I were in the position that you are now, i would certainly take benefit from downloading this type of software we have for free and to put them on your servers there and hook up a few thin clients and get people to be aware that there is no need to carry around a laptop anymore."

"We provide an open infrastructure, which you as an consumer or company should be able to plug in the gadgets or things that gives value to you."

He thinks that its important for an engineering student to have a chance to experiment with the platforms and technologies that they will come in contact with at a workplace, so that they will have the spirit to challenge the current implementations rather than just continue to use what is already implemented:

"If you are not specifically for an position in the IT-department. You are not allowed to try to manipulate the IT-systems at all."

"You have to recognize that then you are an "white collar" worker. They use the IT as a tool but you are not allowed to manipulate system-parameters or whatever."

An important question when looking for a partner to support the TC is what they want to get out of the partnership. The partners usually wants something in return or have some kind of goal with their contribution. It differs a lot between partners depending on the corporate culture and motive to start the academic

initiative. However the demands are seldom specific, because it can be hard to meet specific demands when working with students, this according to Anders Rådlund at IBM Nordic:

"The Tech Center and the activities you are doing are very strategic and promising work to increase the Power System I server skills in the market and also to increase the awareness of the platform to students."

"Off course certification on and skills to server, configure and support a Power system I server. The also experience of using the server for development projects, Java Programming, Solutions design, database mining, Websphere training, basically anything that also shows the wide areas Of techniques where the server can be used."

According to him their demands are closely connected to the technology IBM gave to the TC and one of their goals is to make sure more students have a chance to work with their technologies. When it comes to expectations:

"The first step are successful certification tests Then the number of students that actually finds new jobs in this area."

"Networking with business partners and customers to find job opportunities for the students. Trying to secure sponsorship with both financial support as well as manhour for teaching initiatives and support of your System I System."

He also states that their goal with the TC partnership is to get more students to take interest in IBM iSeries technology and get certified, but also to help students get a job. Anders Rådlund did not mention any wish to see further implementation of IBM systems within the IT-Universities regular activities. Most likely because IBM does not have any plan to use their academic initiative to sell IBM technologies to Universities.

This can be compared with Kent Åbergs answers from SUN:

"and then I hope that i will see more of SUN as an infrastructure provider at your school. I want you to use our storage environment, i want you to use our servers."

Among other goals SUN wants to see the IT-University use more of their technology. Another difference is that SUN as mentioned above wants to use their academic initiatives as an open lab environment for the students. IBM's goal on the other hand is to use their academic initiative to help students get certificates that they would otherwise have a hard time to get on their own. And also help students find a job with the skills leaned from working with their technologies. IBM's goal as mentioned above is closely linked to the specific technology provided:

"The Tech Center and the activities you are doing are very strategic and promising work to increase the Power System I server skills in the market and also to increase the awareness of the platform to students."

Overall the difference between SUN's and IBM's academic initiative is that IBM appears to be more specific and market focused while SUN seem to be less specific and more idealistic.

Finally the success factors for the TC as a lab environment is to find a balance between the different partners and their goals. To make sure that the TC is an open lab environment and at the same time be able to support market focused initiatives.

4.2.2 Student interest

When it comes to success factors relating to students and their interests Kent Åberg says:

"I hope there is a lot of students that are eager to learn our technology,"

"I hope, we manage to create an interest for SUN so that students goes on a daily basis and explore our web pages and so on."

He hopes there is a lot of students that interested to learn about SUN's technology, but also to create an interest for SUN and what they have to provide. When we asked him if they have any specific method to measure their success with student interest, he said:

"Maybe sort of metrics on the number of students or people old or young that come to your center and explore and what you have there. We are currently happy if you can convince them or get them interested in what we can provide."

They don't have any specific metrics for success. Only a wish that many students will get interested in what SUN have to provide.

Anders Rådlunds expectations about the partnership with the TC is as mentioned in previous topic closely connected to the technology they provide to the TC:

"Off course certification on and skills to server, configure and support a Power system I server. The also experience of using the server for development projects, Java Programming, Solutions design, database mining, Websphere training, basically anything that also shows the wide areas Of techniques where the server can be used."

He hopes to see students learn how to use the specific systems given to the TC but also everything those systems can be used for.

The success factor for student interest is to get as many students as possible, to use what the TC has to offer and to continue the work to improve the TC. It is also important to be able to stimulate the students innovation and curiosity and at the same time meet the partners expectations.

4.2.3 Effective University collaboration

When it comes to organizing the collaboration between the University and a partner we think that it is important to establish good communications. Kent Åberg says that it is important to have contact with both students and teachers at the University.

"So I think it's good to have it on both the faculty level and the student level."

He also talks a lot about what he wishes that the students should be doing with with the SUN academic initiative. He says:

"I hope there is a lot of students that are eager to learn our technology,"

"I hope, we manage to create an interest for SUN so that students goes on a daily basis and explore our web pages and so on."

To get the students interested in their technology is a problem for both the vendors and the TC. From our own experience of a problematic collaboration with a vendor early in the creation of the TC, we can say that it's absolutely vital for both sides to work hard to ensure that the collaboration is going smoothly. Because if the vendor is not supporting their own investment in the project it can be hard to make it work on the TC side. If there are too many problems with the hardware and they aren't solved rapidly it can eventually make the students lose interest in the platform altogether. So it is very important for hardware and software vendors to support their own technologies at least in the beginning or else it can effect the result negatively.

When establishing multiple partnerships it is going to be increasingly important to have strategy on how to handle this effectively. Anders Rådlund at IBM expects to have one contact person:

"One teacher that will function as key contact as we have today is important to have."

IBM's academic initiative does not have anything corresponding to SUN's campus ambassador program. But they hope to create networks with their business partners and customers to help students find jobs:

"Networking with business partners and customers to find job opportunities for the students. Trying to secure sponsorship with both financial support as well as manhour for teaching initiatives and support of your System I System."

When asking Urban Askabout Student - Partner relations, his response is that it would be a dream-scenario in most cases if it were an option but why isn't that possible today? He thinks that it's asking a lot of the partners, one must setup a meaningful relationship towards the partners with a plan of what kind of services that should be provided. When referring to the business economics point of view, students must know what is expected of them when they get out, that's a way for partners to see how much they must provide.

The plan to involve students more in to cooperations with partners is a fine line to walk on, due to our survey it shows that it's more suitable to have clear goals and motive for coursework from partners. It should be relevant to the cause and the industry it supports, it's also important for a student to get in contact with

partners for future work. There are tons of initiatives within GU that gets students in contact with the partners involved internal and sometimes external, but a dream scenario would be to have a working construct like the TC to mass produce workforces for the partners all ready to get in the industry and start working.

Urban Nuldén thinks that it's just as important to have a good contact with relevant partners as it is to have a good contact with other schools, to cooperate with and extend the TC's services. The TC will also work as a center for solutions that will affect other schools to make them come and look at the IT-University for competence and technology. This is a vision that was shared with the chief of the TC:

“We want to have the ability to get students in contact with our partners and other schools that wants our competence.”

Good contact with different schools will hopefully lead to more cooperations between the affected Universities. Thanks to the TC it will be easier for companies to get in contact with the IT-University and maybe get in contact with multiple Universities at once. The TC will hopefully inspire other Universities to do the same.

Urban Nuldén also want the TC to act as Handels consulting:

“We want to act just as Handels Consulting where they send out their students early to work with business solutions during their study. Hopefully we can provide a service in the same kind and finance our students so that they want to work with the TechCenter.”

The TC will aim to provide similar services that match Handels Consulting. They will work to get the students in contact with technology that are provided by different companies as fast as possible.

From our interviews we learned that all partners wants to have a stable contact person in the TC. Most likely the person in charge at the TC or the person that started the collaboration. It is also important to have good collaborations with other Universities and other organizations to be able to improve the TC and help students get in contact with employers. Making this work is the success factor for effective University collaboration.

4.2.4 Resources needed

One of the most important success factor for a TC if not the most important, because it is the purpose of the TC to give the students access to various platforms and technologies. It is important to secure support from large software and hardware vendors or finding financial support in order to gather as much hardware as it is possible to use effectively.

Kent Åberg is talking about using the software that SUN provides for free and to start experiment with it, but also setting up thin clients with SUN software available to the students:

"If I were in the position that you are now, i would certainly take benefit from downloading this type of software we have for free and to put them on your servers there and hook up a few thin clients and get people to be aware that there is no need to carry around a laptop anymore."

"We provide an open infrastructure, which you as an consumer or company should be able to plug in the gadgets or things that gives value to you."

This is a strong contrast to what Anders Rådlund said:

"Support to get the 570 machine at the University up and running and with the right Software installed"

IBM seems more focused on their system whilst SUN seems more interested in providing an open infrastructure. Kent Åberg says:

"If this TechCenter can teach other the concept of open computing or whatever or to show it in some way."

SUN appears to be using it's academic initiative to support and promote open computing concepts instead of limiting customers to their systems. It seems that SUN's academic initiative is more idealistic than IBM's, since they are trying to encourage open computing rather than focus on one system.

IBM again focuses on the system that they provide:

"Curriculum and teaching skills-specially to help the teachers to get the right level of knowledge about the platform to transfer the knowledge to the students. Support to get the 570 machine at the University up and running and with the right Software installed."

They focus to get the machine running and making sure that their clients are getting proper support for it and also helping teachers to get the skills needed to teach students on how to use the system.

The TC is striving to have relevant systems and platforms to provide for the students. This is what the Urban Nuldén thinks:

"Different systems and platforms which make it possible for students to become consultants."

Becoming a consultant is difficult and takes time and most students need to spend their time at the University studying. The TC will help the students to specialize early.

The platforms must be up to date. This requires a good cooperation with the TC's partners. Without good cooperation between the partners the systems and platforms will not be relevant for the students to work with in a production environment. This comes with all the challenges that Universities are facing with the forming of relevant courses that will support and help students. With the TC they are taking one step closer in creating an education that helps students get jobs in the real world, and be prepared for it. The systems therefore must be kept under strong maintenance. Anders Rådlund says:

"It depends on what precertification courses we need to use our platforms for. the iSeries machine needs to be updated frequently with exercises the rest is pretty much self sustained."

According to the Urban Nuldén, the technical expectations are:

"Technical platforms do develop on, not normal IT-Service like fixing computers and such."

The TC must have good knowledge about what machines the companies develop on. The partnerships are crucial for the TC to be a successful learning organization. Environmental analysis and partnerships to guarantee what we could call relevant learning. Relevant Learning is a set of recommendations and you can find a lot of what the TC is striving for among them, for example:

"It is better for college students to be active seekers rather than passive recipients of learning." (Lowan, 1994)

Thanks to the TC, the students can be active seekers because of the close contacts with the different organizations. The TC encourages students to get in contact with the companies actual technology and study them, by having lessons and give the students changes to take certifications.

Urban Ask's idea of a TC is if you have a C for "center" it expects that one have built a critical mass for competence, it's a place where different types of questions can be combined with the centers activities. If it's a "Technical Center" than naturally it would focus on technical issues which is relevant to the cause. You should work towards what is presented in the beginning, if it's technical related a meeting area with the academy and the industry should be established to discuss these technical issues. His view of a center of competence reflects a lot on what kind of establishment is required to support the cause of the University. In their case they had to support the fact that the intelligence behind economics/business needed to be refined. Their students had to have a supporting architecture to ensure that they where learning right kind of Business Enterprise Systems, which they would come in contact with on the outside.

This was a demand from the industry partners that where affiliated with the Handels University. The project of establishing this supporting construct was the mission to sort this problem out and later became the CFA. He also describes the problems when facing this so called center or construct that an specific type of organization gets built at the side of another organization may not actually cooperate the fullest to the main organization. It's usually created for a special purpose, so it's important to have the management support with the construct, such as principals or senior management etc.

Urban Ask also state that this sort of a construct can't just evolve out of nothing and there must be a cause to support it. It's natural for a University in Sweden to have some sort of "external" constructs of this kind to support certain courses or programs. It's also usual to see student-partner work programs to get the personnel out of universities as fast as possible and right in to the industry, this is usually supported by initiative projects from partners and such. In any case, when establishing this kind of a center construct with allot of partners and supporting platforms one should have the full support of the University's board-members.

Something that usually comes up when interviewing heads of TC's like Urban Ask, the notion of them being to small even in the beginning gets repeated. When in fact most constructs of this sort usually are very small in the beginning, at least Universities in Sweden, because they need to prove themselves to be the right initiative for the purpose they are built from. Another repeated comment is that if more finance and personnel were involved they would have been bigger, better and would earn a lot more than they are doing now, but that is a common thought amongst many industries as well.

Every vendor have their own programs, initiatives or collaborations and it is important that they support their own technologies. In this success factor you can also count the need for server rooms and what standards that should follow.

4.2.5 Workforce

When asking Urban Nudén about what the workforce consisted off:

“Primarily me, William Sullivan and Björn Olsson and a lot of students managing the platforms.”

From this point it was clear that the TC was only driven by the people in the University. This makes it harder for the people that are working with the TC to work with it full time. Therefore the TC needs help from the students. But they don't have the possibility to work full time either:

“When we speak of students they can't work at 100% because they have school work and the group of personnel in the TechCenter is mostly students.”

Therefore the work must be divided equally. Usually in this case the main people take care of the administrative sections and the students takes care of the technology. There is always a challenge between balancing the workforce of the sub-organization and the main organization. A sub-organization driven by people from the main organization must balance the workforce equally so neither organization will take damage of the location. The type of damage could be a lesser effective workforce in either location at the IT-University.

4.2.6 Avoiding problems with bureaucracy

Also important to notice when creating a TC is what types of laws and regulations that affects the construction of the TC. We asked Kent Åberg if he know of any differences in creating a TC in Sweden or in the USA. He didn't know much about the TC in the USA but he did know that if you worked with any form of technology in the USA you had to make sure that you followed USA trade regulations:

"I am not so familiar with the TechCenters in the USA, but I guess its more or less the same type of activity or setup. The only thing that I am very much aware of is that if a TechCenter is displaying some technology you must a line to US export regulation. You must make sure that you follow them..."

But in most cases the rules and regulations are easy to understand and follow. Leaving relatively small effect on the overall construction of the TC. Kent also mentions:

"Basically the US export regulation that is the frame-work, but I don't think there is another regulations from the government here."

As we found out in a later interview with Urban Nuldén the laws and regulations in Sweden on the Universities is very open and gives the Universities a lot of freedom to organize their work. The only strict regulations is the financial support from the government when it comes to financing courses. However the Universities can choose for themselves what they will do with the money thats left over:

"The government bureacracy affects us almonst none at all, we still work as a University should."

Seeing as our predictions proved wrong, as long as the TC are working as a University, there are no problem with the government.

We also asked Urban Nuldén how their organization was funded:

"We provide programs and courses get our funding from the Government and the remaining budget goes to managing and setting up the TechCenter."

As long as the TC are able to set up courses that will affect students. There is no problem with getting the organization founded. Therefore in order to have a successful economy the TC should have successful programs and courses.

In this success factor it is important to analyze the rules and regulations that you have to follow. If you don't do this you can end up stalling the project just because of a law that you overlooked.

5. DISCUSSION

5.1 The Resulting Success factors

Finally we could summarize what was most important and write our own success factors for the TC. And in order to form our themes as success factors we just need to form their names a little differently.

The success factors that the TC then should have would be: A successful lab environment, good student interests, effective university collaborations, have the necessary resources, a good balance of workforce and a following of it's required bureaucracy.

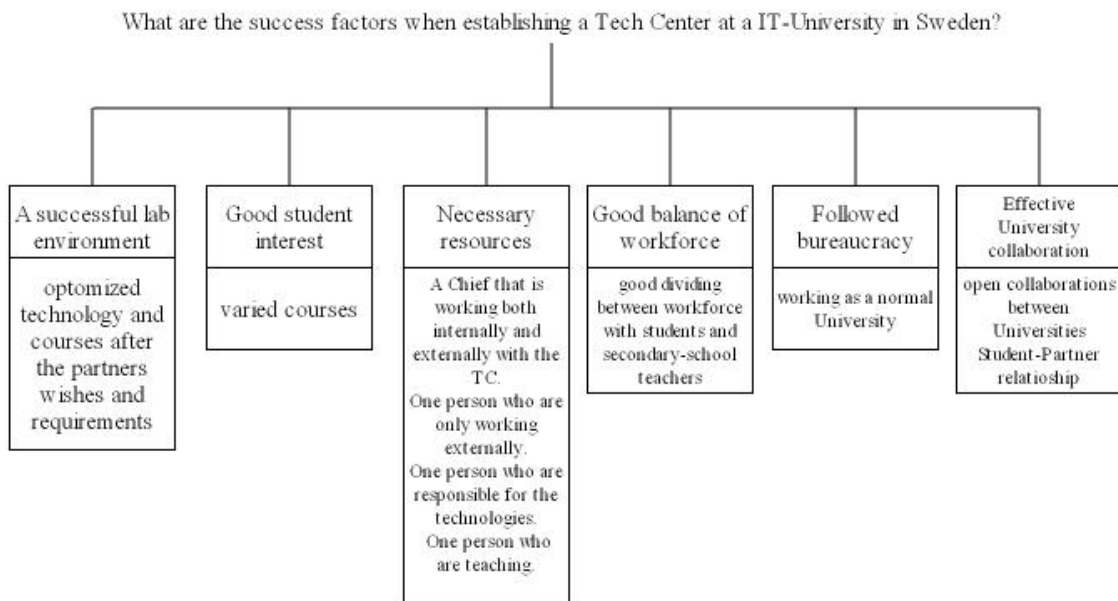


Figure: Summarizing of the success factors

Figure 14: Summarizing of the success factors

5.1.1 A Successful Lab Environment

In a successful lab environment the students must work with technology that the companies are using in their production environment. Chalmers solves this by having their technology based on a client-basis, where they are providing this technology through their clients wishes. TC's technology such as platforms are optimized after the companies wishes and requirements. These wishes and requirements will be made clear for the administrative of the TC through meetings and conferences with contacts that drives through the companies wishes. such as SUN's Business development manager at the Academic initiative with his wishes that the students should not limit themselves to one platform.

Thanks to SUN, the TC will have a successful lab environment with a good variability in platforms. And IBM's "*Business Development Specialist*" are pushing the usage of their iSeries solutions, which will result in a mainframe for the TC. Their technology will then be studied and the courses will be set up so all students can work with this technology in a successful lab environment. The TC will also develop courses that will fit to these companies standards. The courses will be made available for everyone who qualifies and wishes to participate just like a normal University. This will in the future result in lesser problems for the companies that doesn't have to train the students when they arrive at the companies. It could even result in lesser trainee courses.

The TC hopes to be a center for all technologies and solutions out on the market, organizing this technology provided from companies to one place where it can be put to use in this lab environment. Examples of this technology are an easily accessible possibility to steer virtual server environments. Making the TC easily and accessible for everyone at the IT-University.

5.1.2 Good Student interest

The TC will have a wide variety of courses to apply to the students interests. All different courses such as programming to basic administration. The courses will be structured through the companies requests and then registered through the IT-University's regulations and standards so the TC will not differ as a sub-organization on the main organization. The teachers will be both IT-University's Assistant Professors but also students themselves. A student that is fully learned in a specific technology can share that competence to all the other students at the IT-University.

5.1.3 Effective University Collaboration

Thanks to the TC the IT-University now have a center of solutions that provides Student-Partner relationships through their technology, just as Chalmers and Handels are providing today. The TC will not always act as a center of solutions for companies but also offer a great possibility for the University's collaborations as well. Thanks to that the TC is working as a center for solutions it will attract other Universities who wishes to partake in these solutions and therefore the TC will build up a strong interest and resources that will attract more companies interests. Strong collaborations that combine courses with student's from other University's will be possible. A chance for student engineers to do laboratory work with TC's technology and widen their knowledge about the advanced technology that today's companies has to offer.

5.1.4 Necessary Resources

The basic things that the TC need to have is strong connections through their partners so that it will result in relevant technologies. A strong variation of software and hardware that will provide the necessary resources to have good courses and provide certain certifications necessary to be qualified in the different platforms. The registrations on these courses will follow the standard procedures that are required of the University's course administration. The people who are working with the TC must at least be these people:

- A Chief that is working both internally and externally with the TC.
- One person who are only working externally.
- One person who are responsible for the technologies.
- And finally one person who are teaching.

5.1.5 Good balance of workforce

This includes the challenge with having people working inside a sub-organization the same time as they are working with the main organization on the outside. This makes it crucial for the personnel in the TC to have a good dividing between their work duties. The TC's workforce consists of student's and they have studies that prevents them from working 100% with the TC. A possible observation of the TC and the IT-University could have revealed how exactly the workforce is balanced and from there a possible analysis of effective usage of workforce of a main organization within a sub-organization could have been formulated.

5.1.6 Followed Bureaucracy

We thought that it was a big problem for the TC to follow the laws of the government and the regulations for a University. It turned out to be not that hard since the TC works as a University, the regulations will be the same. Universities are very open-minded and allow the creation of different associations as long as they follow the required regulations. An interesting study could have been what type of courses that are allowed at a University. Since the limits seem very low, one could speculate what type of courses that you could have through a sub-organization at a University.

5.2 Critical discussion

We could not make an detailed definition of the purpose of a TechCenter only loosely describe its purpose. We have identified success factors through a survey of the organizations in this thesis. The reason for not trying to make a detailed definition is that it would require a larger survey, more research on other related work and empirical data of a TC's development.

It could have been valuable to the thesis if we had more research on departments or sub-organizations but that would have been to much for a bachelor thesis. We could have compared a department at a University with a sub-organization in a for-profit organization. But we think that the differences would be too great. You can see this if you compare the goals between these two. A for-profit organization often only have one goal, to make money. A University on the other hand is more focused on research and education. We would have needed a more complete list of success factors for the TC and for other similar organizations, in order to do a comparison.

The problem we had was that the topic we studied lacked previous research so the view of what a TC is varies a lot. The best definition however was given by Urban Ask who compared the TC with a center construct. If we had more time to work with the thesis we would have compared more organizations similar to the a TC and studied more academic work.

Finally we did not include any students in our surveys even if they are a important part of the TC. The reason for this is that it would have taken to much time and their role in the TC is to complicated to summarize, because it would be everything the student could do in an open lab environment. We think it is enough at least for this thesis that we specify what the TC should provide for the students rather than everything they could do.

5.3 Continued research

Our success factors can be used to explain the basics of a TechCenter and its purpose but there are a lot more to do. This is some topics that we hope to see further researched:

A larger study on how TC's are used in Universities today.

A more thorough definition of the purpose of a TC.

Develop a framework for construction of a TC within a University.

What longterm benefits a TC can give to a IT-University.

Possibility to use the TC in other academic organizations, not just an IT-University.

TC's in organizations other then academic.

Empirical study of a TC.

6. Conclusion

The question for our thesis were:

“What are the success factors when establishing a Tech Center at a IT-University in Sweden?”

We did a survey with questionnaires and interviews of the faculty, academic initiatives and organizations with similarities to our definition of a TechCenter. This is the Success factors we were able to establish:

Through our contact with the TC's partners we noticed how important it was to have a good lab environment for the students. An environment that will enable students to experiment with the latest technology more freely than they would in a production environment. Each partner have different motives and strategies that can affect the TC. From this we formed the Success factor: **Tech Center as a lab environment.**

The Students at the IT-University is an important part of the TC they form their own success factor, called **Student Interest.** It is important to stimulate the students innovation and curiosity and at the same time meet the partners expectations.

The TC will be a platform for different forms of collaboration projects with other organizations. This forms the success factor called **Effective University Collaboration.** We learned that all partners wants a stable contact person in the TC and it is important to have good collaborations with other Universities and other organizations.

Every vendor have their own programs, initiatives or collaborations and it is important that they support their own technologies. In this success factor you can also count the need for server rooms and what standards that should follow.

One success factor summarizes the resources necessary for the TechCenter We called this success factor **Resources Needed.** It is important to have the right resources and support.

The people working with the TC also had other responsibilities at the IT-University. This made it interesting to find out how the different people worked with the TC. We called this success factor for the **Workforce.** It is important to know how the key personnel in the TC work.

Because the TC is a part of a University it also have to follow the same rules and legislation. We formed a success factor for this called **Avoiding problems with bureaucracy.** If you don't analyze the rules and regulations that you have to follow or else you might stalling the project.

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- (Kari Wahll, 2008-05) IT-University Assistant Professors / Responsible for student registrations
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Appendix 1 (Questionnaires)

TC-Questionnaire (Face to face interviews with CEOs/Heads)

1. TechCenter

- What is a TechCenter for you? (Give a some clues and examples that relates to their profession)
- What services should be provided at a Tech center? (Give a some clues and examples that relates to their profession)
- In your opinion, what kind of competencies/capabilities does a Tech Center need? (Give a some clues and examples that relates to their profession)
- What do you expect to find in a TechCenter in Sweden? What specific technologies do one need to support teachings or research initiatives?
- Are you involved in something that acts or is a TechCenter today?
- What else is needed except resources for managing a TechCenter? (Give a some clues and examples that relates to their profession)
- What departments do you have in your organization? (Only interesting if it's a company and not University)
- How do your organization-structure look like? Which persons are in charge of IT, mainly in the TechCenter? (University related positions)
- How do you think the TechCenter at IT-University/GBG works? (Give no clues, check if there is some rumours)
- Do you have your own sources for technology? If so, how do you use these capabilities? (Ask about their technical support and if they can deliver)
- What kind of platforms do you use today ex: MS, IBM-Series etc? (Ask about machines and software)

2. Actors

- What do your workforce consist of? Mainly the actors in your TechCenter? Who manage what? (Only focus on the TC)
- What kind of positions are there in your organization? (Only focus on the TC or the department that acts like a TC)
- What are your role in the TechCenter?

3. Options

- Student – Partner realtions, the ability to work with partners during graduation? (Give clues and tips, ask if it's possible)
- Should personell work at 100 % with the TechCenter in a organization? (Pends allot if it's a University)
- Do your personell work at 100 % with the TechCenter in your organization?
- Do you provide courses for former students through your technology center? Why or why not? If so, what courses should be provided for ex Students?

4. Success Factors

- What kind of goals was there in the beginning and are they accomplished today?
- What resources where needed? (Except the obvious once, what should have been more of etc)
- What maintenance was required? (What should have been needed in the beginning or relating issues)
- Which partners where needed? (Pending on which TC and it's main production purpose)
- What should the workforce consist of? (Should it have been more people involved or competancies)
- Do you view the TechCenter here at the IT University as a strategic initiative for our future? Is it simply a distraction from our core mission?

5. Laws and Rules

- Is it possible to have a TechCenter in Sweden working similar as it would in the USA (If they don't know anything about TC's in the USA describe Temple University)
- How does government bureaucracy effect your organization? (Pends allot on Universities and companies)
- How is your organization funded? (Pends allot on Universities and companies)

Question motive	Type of question
Identifying koncept	Hypothetic
Identifying koncept	Hypothetic
probing question	Probing
probing question	Probing
Identifying interviewee (yes or no)	closed question
probing question	Probing
Identify services	Probing
research	Open
research	Open
research	Open
research	Open
research	Open

Identify workflow and hierarchy	Leading
Identify workflow and hierarchy	Leading
Identify workflow and hierarchy	Open

Identifying koncept	Open
research	Hypothetic
Identify current expectations/circumstances	Open
Identify services	Seeking

Identify current expectations/circumstances	Open
Identify current expectations/circumstances	Open
Identify current expectations/circumstances	Open
Identify current expectations/circumstances	Open
Identify current expectations/circumstances	Leading
Identify current expectations/circumstances	Hypothetic

Identifying koncept	Hypothetic
Identify current expectations/circumstances	Open
Identify current expectations/circumstances	Open

TC-Questionsform (To be sent and followed with comments)

1. TechCenter

What is a TechCenter for you?

What services should be provided at a TechCenter?

In your opinion, what kind of competencies/capabilities does a TechCenter need?

What do you expect to find in a TechCenter in Sweden? What specific technologies do one need to support teachings or research initiatives?

Are you involved in something that acts or is a TechCenter today?

What else is needed except resources for managing a TechCenter?

What departments do you have in your organization?

How do your organization-structure look like? Which persons are in charge of IT, mainly in the TechCenter?

How do you think the Tech Center at IT-University/GBG works?

Do you have your own sources for technology? If so, how do you use these capabilities?

What kind of platforms do you use today ex; MS, IBM-iSeries etc?

2. Actors

What do your workforce consist off? Mainly the actors in your TechCenter? Who manage what?

What kind of positions are there in your organization?

What are your role in the TechCenter?

3. Options

Student – Partner realtions, the ability to work with partners during graduation?

Should personnel work at 100 % with the TechCenter in a organization?

Do your personnel work at 100 % with the TechCenter in your organization?

Do you provide courses for former students through your technology center? Why or why not? If so, what courses should be provided for ex Students?

4. Success Factors

What kind of goals was there in the beginning and are they accomplished today?

What resources where needed?

What maintenance was required?

Which partners where needed?

What should the workforce consist off?

Do you view the Technology Center here at the IT University as a strategic initiative for our future? Is it simply a distraction from our core mission?

5. Laws and Rules

Is it possible to have a TechCenter in Sweden working similar as it would in the USA

How does government bureaucracy effect your organization?

How are your organization funded?

Partner-Questionnaire (For related partners of the TC at the IT-University)

	Question motive	Type of question
1. TechCenter		
How do you view the TechCenter here at the IT-University?	Identifying motive	Hypothetic
What services/systems are you hoping to provide for IT-University?	Identifying motive	open
In your opinion, what kind of competences/capabilities do you hope the students to have from your systems/services?	research planning	open
2. Actors		
How many of you are working with the academic initiative?	Identify workflow and hierarchy	open
What is your position?	Identify workflow and hierarchy	open
What should the workforce consist of when using your systems/services you have and will provide us?	Identify workflow and hierarchy	steering
What kind of a contact person here at ITU are you expecting to have? Student, teacher etc?	Identify workflow and hierarchy	open
3. Options		
Student – Partner realtions, the ability to work with partners during graduation? What kind of initiatives are you hoping to establish at ITU?	Identifying motive	open
How do you organize your academic initiative?	research planning	Hypothetic
How long have you had an academic initiative/University partnership and why did you start it?	Identify current expectations/circumstances	open
What experience do you have from working with Universities and what Universities have you worked with?	Identify services	open
4. Success Factors		
What kind of goals with your systems do you expect us to make?	Identify current expectations/circumstances	open
What resources are needed?	Identify current expectations/circumstances	Steering
How do you start a partnership with a university or vice versa?	Identify current expectations/circumstances	open
5. Laws and Rules		
Is it possible to have a TechCenter in Sweden working similar as it would in the USA with you as the partner?	Identifying motive	Hypothetic
How does government bureaucracy effect your organization when working with students and giving away systems, mainly here in Sweden?	Identify current expectations/circumstances	Leading

Partner-Questionform (To be sent and followed with comments)

1. TechCenter

How do you view the TechCenter here at the IT-University?

What services/systems are you hoping to provide for IT-University?

In your opinion, what kind of competencies/capabilities do you hope the students to have from your systems/services?

2. Actors

How many of you are working with the academic initiative?

What is your position?

What should the workforce consist off when using your systems/services you have and will provide us?

What kind of a contact person here at ITU are you expecting to have? Student, teacher etc?

3. Options

Student – Partner realtions, the ability to work with partners during graduation? What kind of initiatives are you hoping to establish at ITU?

How do you organize your academic initiative?

How long have you had an academic initiative/University partnership and why did you start it?

What experience do you have from working with Universities and what Universities have you worked with?

4. Success Factors

What kind of goals with your systems do you expect us to make?

What resources are needed?

How do you start a partnership with a university or vice versa?

5. Laws and Rules

Is it possible to have a TechCenter in Sweden working similar as it would in the USA with you as the partner?

How does government bureaucracy effect your organization when working with students and giving away systems, mainly here in Sweden?

Faculty-Questionnaire (Face to face interviews faculty members)

Did you know about the TechCenter?

What do you think a TechCenter is? Then explain for them what a TC is if necessary.

Do you think our TechCenter is necessary?

Can you find some usage for the TechCenter?

Appendix 2 (Introduction page)

Technology Center at IT-University in Gothenburg

Introduction:

The TechCenter initiative was started by William Sullivan, a Senior Lecturer at IT-University, because he saw a need for more technology in the education. He started by establishing contacts with hardware, software vendors and consulting firms academic initiative to get support. He also started to get students and faculty involved with the TechCenter in order to advance the project further. It soon became apparent that the TechCenter had a lot of potential and that it was a great need for the services it could produce. Over time, the mission of the TechCenter has expanded and been clarified.

Mission Statement:

We are creating an organization in the IT-University of Gothenburg that can provide the students access to advanced technologies and platforms that they would otherwise not been able to work with, in order to improve the depth of the knowledge during their education. Support student projects with access to technology they would not be able to access on their own. Support student dissertation and University research. Support professors and lecturers with access to technologies that would help them to improve education and research. Improve partnerships and collaboration with private and government organizations and institutions. Strengthen the reputation of the IT-University internationally and attract more students.

Achievements:

To date we have established partnerships with several larger hardware and software vendors such as IBM, Unisys, Sun, Microsoft and VMware. We have worked with IBM to become a technology hub for their academic initiative. We have installed and configured a System i 570 mainframe from IBM to use as a platform for IBM Technologies. We also have several Sun enterprise 4500 servers used to support various databases. Unisys has also recently expressed an interest in supporting us with a large server.

We have this set up 2 courses for the students, one IBM presert. course and an C# course that attracted around 150 students without advertising. Currently we have Scheduled an Java programming summer course and an Sun pre-certification course and more to come when we can secure stable financing.

Purpose of Our Thesis:

The purpose of our thesis is to explore the concept of an academic technology center and identify the challenges that a university faces when establishing a technology center. Finally, we also want to identify the critical success factors for a technology center. To accomplish this we need to find who could benefit from the University and interview them, and also find similar organizations and find out how they have established a TechCenter and gain their perspective.