

# Networking People



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## 0. Summary

In this document, we will present a new type of application to help people to build their social network. Some ideas from classical social networking software and visual query tools have been taken.

Social networking software is a product that you can use to define yourself and who your friends are. If you are looking how you can get in relation with someone in a specific company, social networking software will display which person you need to contact to be introduced to this person. We can enumerate [www.linkedin.com](http://www.linkedin.com), [www.orkut.com](http://www.orkut.com), [www.foaf-project.org](http://www.foaf-project.org), and many others websites.

This project was done in IMD. IMD is one of the major business schools of the world and is also a reference as a “global meeting place”. His role is to give a formation to managers of today and tomorrow. Managers are the customers of the school and we can enumerate two types of managers: Those who are coming to build their network (strategic) and the others who have not yet seen the social networking capacities of IMD (serendipity).

How can we help managers to better network?

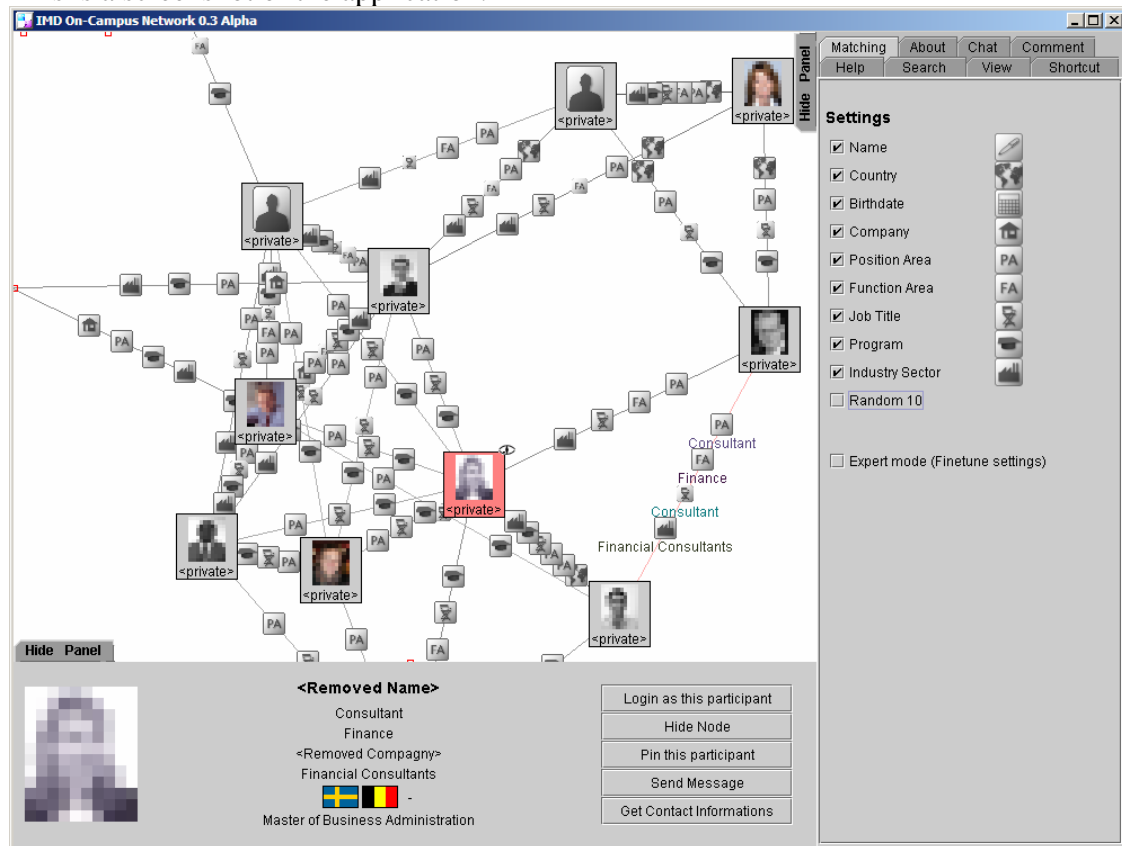
We will focus on the following topics:

- How can we help the strategic managers to better network?
- How can we help the serendipity managers to better network?
- How can we speed up the process of accommodation
- How is this software integrated to the IMD “global meeting place” project?
- A less formal system.

We have developed a tool that shows participants who are currently on the campus. Participants will be aware of the opportunities they have to develop their current social network in IMD.

You can browse in you own defined network using this application. You can for example build a network based on the country of managers, or you can build a network that is based on the position of managers, or many others factor. This software is also a “visual query builder” that can be used to find people on the campus in a very interactive and fun way.

This is a screenshot of the application.



### How does this application help the strategic managers?

The strategic managers are people who are looking for specific contacts. Using this application, strategic people can find a user matching a specific profile. They can also see people who are more or less similar to the searched profiles.

They can then recuperate the contact information or directly contact the participants they are interested in by using the “send message” and “get contact information” buttons.

### How can we help the serendipity managers?

Serendipity people are people who are not really looking for a contact. Serendipity people will have fun using this application and seeing networks of participants. They will play with the application. Our wish is to give them the envy to contact others participants by showing participant that are similar to them.

### How can we speed up the process of accommodation?

Participants are on a very moving society. People are leaving and coming each week. We want to shorten the time needed to be able to start communication between participants.

We want to give to the participant a view of who the people currently on the campus are and what kinds of group of people are on the campus (i.e. “This group of China people”, “this group of managers”). We want to give the possibility to participants to know who the other “interesting” participants are in a very short timeframe.

**How is this software integrated to the IMD “global meeting place” project?**

This software will show people who are currently on the campus. Using this software, participants will find relations between participants and themselves. They will find people who have similar profiles. They will be able to see that they have 300 opportunities of networking, that is more than the about 40 participants who are following the same course and who are in the same area. Participant will be more aware that they are in a “global meeting place”.

**A less formal system**

Our software is more natural than others social networking software and textual query software. With the possibility to customize the network, the participant has the possibility to view his own network. He also has the possibility to see groups of people that are on the campus. He will see group like the “Swiss people that are in a specific program”. With our approach of similitude, we have a less formal approach than classical “query systems”. The navigation between participants is very intuitive, but the button to customize the application needs to be redone and simplified. Users could be disappointed by this new way of navigation/query because most of them have learnt to use more classical search tools like [www.google.com](http://www.google.com).

With this application we have brought a new concept that is between “social analysis software” and “social networking software”.

## Table of content

0. Summary .....	2
Table of content .....	5
1. Introduction.....	6
2. State of the Art.....	8
2.1 Why are social networking tools becoming so popular? .....	8
2.2 Two types of Networking .....	10
2.3 Shared advantages and schmoozing.....	11
2.4 Where does networking occur?.....	13
2.5 Social networking tools enumeration.....	14
2.6 Developing our social network using mobile device.....	16
2.7 Social Networking using fixed device & internet.....	18
2.8 How to trust an unknown person .....	22
2.9 Communication and technology .....	23
2.10 Time for communication.....	25
2.11 Distance and communication.....	25
2.12 Privacy .....	26
3. Objectives .....	27
4. Context.....	29
4.1 Who is IMD?.....	29
4.2 Constraint.....	30
4.3 Requirements .....	31
4.4 Used technologies .....	33
5. Solution.....	34
5.1 Description of the Solution .....	34
5.2 Screenshot.....	36
5.3 Algorithms .....	42
6. Results.....	46
6.1 User evaluation .....	46
6.2 Future .....	47
6.3 Other sets of Data.....	50
7. Conclusion .....	54
8. References.....	56

## 1. Introduction

In this project, we will evaluate a way to find people using a visual query tool. A “visual query” is a way to search and display results in a graphical way, compared to textual queries and linear results like on [www.google.com](http://www.google.com).

We will focus on how we can help participants to improve their “social networking capacities” using this tool. How they can meet more interesting people during their program in IMD.

To introduce social networking, we will take the description on Wikipedia.

### **Social Network** [4 / Wikipedia.com]

*Social networking describes the process of connecting individuals via friends, relatives, and [acquaintances](#)--a person's "[personal network](#)." These networks can then branch out and allow friends to connect with people inside their accepted [social circle](#), allowing for a perceived greater sense of [security](#), compared to someone perceived as being [anonymous](#) and [random](#).*

*Social networking software have emerged as a phenomenon in [2003](#), allowing the newly-populous [Internet](#) to serve as both a buffer and a safety net for introduction to friends by friends once possible only in person.*

*This type of social interaction on the Internet is a logical extension of the [blog](#) and [Instant Messaging](#) phenomena: blogs allow for a more community of personal inquiry and thought while IM systems allow for only accepted users to chat. There are hybrids, however, such as the concept of [FriendBlogs](#), which combines social*

We are building and making consolidation to our social network all the day, e.g. when we eat with someone, when we speak with a colleague, when we share emails and ideas through newsgroups, when we go to our fitness club or football club, to our favorite pub, etc. **We consolidate our social network by communicating with others people.**

### **Communication** [4 / Wikipedia.com]

*Communication is the [process](#) of [exchanging information](#) usually via a common [system](#) of [symbols](#). "[Communications](#)" is the [academic discipline](#) which studies communication.*

Nowadays people have more difficulties than ever in keeping and creating their social network. We can see that by the popularity of dating websites and events. Do you even know who your neighbours are?

Some of the causes are the change of the society. Many people don't have time anymore because of the multitude of different activities you have: You can play your favourite computer game. You can transform the movie of your holidays to the DVD format. You can watch the television. You can browse the Internet. You can watch the news. The time needed for all these activities must be taken somewhere and most of the time this is taken on "Social Networking Event" time, for example you don't have time to go to your football club, your brass band, and many other activities that can be used to extend your social network.

In the same time, People still need to communicate and an interesting effect is the increasing popularity of the virtual world. People don't have time to communicate in the "real" world so they network more and more in the virtual world. We can see that by the success of Internet communities and mobile phones. Why is the mobile phone so popular? You are always in touch with your community by using it. You can always contact and be contacted by all your friends. Email is a similar example of a way to communicate to keep your current social network. We can also see in the success of virtual communities that networking is more and more popular. Online Gamers are a good example: they form teams and communities to play with others people. We can also see the success of chat rooms, dating websites, forums and Internet role playing games: some people are so dependant on these communities that it can even be seen as a new psychological illness.

We will focus on one type of technology YASNS (Yet Another Social Networking Service). YASNS are websites in which you describe yourself and all your friends. You can use this system to know how to link to other people. If you are looking for information about a company, you can ask one of your friends to introduce you to one of his friends that work in this company. YASNS have been seen as one of the best emerging concepts in 2003 based Wikipedia. [4]

We will work in an environment of managers that are following a program in IMD during a few weeks. Why is networking so important in this environment? When you start a job as a manager, technical skill might be sufficient. When you go to a higher position, you need lots of relations with other managers. Not being able to network is seen as one of the biggest failures in management according to some literature. [6]

Managers that come to IMD arrive in an unknown environment. They don't know a lot of faces and they have to extend their social network in a very limited timeframe. We want to give them the possibility to know who the other "interesting" participants are in a very short timeframe.

We have two types of managers. Those who know that they are looking for a specific group of participants (they are here to develop their social network) and those who don't really see the opportunity they have at IMD and networking. We want to target the two types of participants in our system.

In our approach, we will display social networks on a screen. People will be able to see the face and the description of other people. The network will not be built by the use of friends like common social networking software, but by many other relations like programs, belonging to the same country, same position, same function and more. The person that uses the application will be able to customize his view of the system to view the network he wants.

With this approach we want a system like social networking software, but that is more intuitive and more fun to use. This system won't replace face to face interaction, but will be a way to prepare this interaction.

## 2. State of the Art

In this chapter, we will describe the basic concepts of social networking.

Why are social networking tools becoming so popular? Where networking occurs? When is the perfect time for networking? What about relations between networking and technology? We will develop these concepts in this chapter.

### 2.1 *Why are social networking tools becoming so popular?*

The number of results on Google using the keyword "Social networking" is 373'000. If we count the number of references on Wikipedia to "social networking systems", we get 22 references to external websites.

The popularity of "people introducing software" like "SpotMe" in public event also shows the popularity of social networking tools.

Social networking is not a new concept. It exists since ages in more or less secret societies like "freemasons". There are references of this society since the early ages of Egypt. Freemasons is a way to share idea, but also a way to share trust and advantages. Another concept of social networking is Alumni groups. Alumni groups are more and more popular and exist since a long time. Alumni are groups of people that have followed the same school. Alumni groups are a good way to share information with people that are in the same field as you. This is also a good way to find employment.



So why is it interesting to have help in developing your social network by the use of social networking tools? [5]

We will give an answer by asking some questions.

- How did you get your last job?
- How did you find your favorite restaurant?
- How did you find your apartment or house?
- How did you find some very interesting Websites?
- How did you find this very valuable item?
- How did you find this perfect unknown product?
- How did you find this perfect low cost shop?
- How did you find this lovely and perfect boy / girl?

One of your answers will probably be: “One of my friends told me” or “I was speaking with someone, and he spoke to me about this great product”. It is also known that one of the best advertisements is an advice from one of your friends. (“I heard it through the grapevine”)

**Direct source to information:** Today the best way to have an advantage on other people is to know something before they do. The best way to get information before other potential competitors is to have a direct link to the source of information. More and more people use this possibility and are conscious of this fact. An example is when you are looking for a job, an apartment. If you know many people in many different companies and you speak about the fact that you are looking for a job/apartment, there is probably a place somewhere that is not yet posted anywhere but where you might be the perfect match.

**Networking in a time efficient manner, using technology to speed up the networking time:** A big problem today is that people have less time to be in a group due to the large amount of technologies (TV, Internet, Games, PS2, Xbox and so on). People need to take this free time from others activities, activities that were helping the communications between people (football club, singing band ...). With the presence of Internet, some people have discovered that they can develop their network of “friends” in a fast and time efficient manner. You want to network, you just have to connect to one of the multiple virtual community website. You will find some of your friends. You don’t want to network? You just have to switch off your connection. If you only focus on people that interest you by just looking some information related to others people, you won’t “lose” your time trying to build a relation with someone that is not “useful”.

**Networking in the management domain:** This is the same thing in the management domain. Wayne E. Baker wrote [6] that success depends on relationship skill: how well we build good relationships with peers, superiors, subordinates, groups, teams, customers, suppliers, investors and a multitude of others. In some literature [6], it is written that the main failure for manager is the failure to develop good relationships: If the manager is not able to easily communicate and build and maintain his social network, the information will not be shared between him and the employee. We can see in many studies that success as a manager hinges on the ability to cultivate, maintain, and mobilize a vast array of relationships inside and outside the organization [7]. Network-building skills become even more and more important the higher you go. [8]

*From [6], page 4-5*

Building relationships is and has always been an important part of the manager's job. The world of business is changing so fundamentally that new ways of managing are required – demanded – and your success depends more than ever on how well you build and manage network of relationships. [...]. You can see it in several widespread trends that are creating the urgent need to be better, faster, and smarter at building relationships.

This is some reason why since 2003, Social networking software have emerged as a phenomenon [4]. The other reason was that the technology was mature enough to support these social networking tools.

## **2.2 Two types of Networking**

Based on some literature, we can define two types of networking: Strategic and Serendipity. [5]

**Serendipity networking** is unplanned networking. You meet someone because you were both there. We can take the example of two friends that go out somewhere, one of the two meet another friend. He will introduce this person to his friend. This is an unplanned networking as both persons are not introduced for a specific reason.

**Strategic networking** is planned networking. You meet someone for a specific reason. We can think of a manager who has started a start-up and need funding. He could ask one of his friends to introduce him to someone who is interested in investing some money.

At IMD we have the two type of networking. A part of the participants are here to know new people. They know the types of participants they are looking for: this is a strategic networking. They are searching other participants to open new opportunities. They are for example interested in meeting participants of a specific country because they want to

open a new company in the country. The success of the program is more for them the number of visit card they have than the content of the program.

Another type of networking at IMD is participants that are here to learn and follow programs. They are happy to meet others people and their first wish is to share knowledge: this is a serendipity networking. You don't expect to network with a specific type of participant. The success of the program is more for them the knowledge they have learn from the program.

Serendipity networking is a more natural way of developing your social networking, you "**have**" a reason to communicate. Strategic networking looks less natural: You are choosing the people you want for your social network and you must "**find**" a reason to communicate.

### ***2.3 Shared advantages and schmoozing***

With social networking you are exchanging knowledge, you share discussion and contacts, you share fun and you can trust people. Living without networking is nowadays a very difficult standard of life.

Why do people network?

People network because they have an advantage in networking! Your friend are your friends because both of you have an advantage in being friends. You share fun, you share help, and you can share many others things. Both of you are winners if the relation is bilateral,

This is an enumeration of some advantages of networking.

**Share knowledge:** You can share information and improve each other knowledge. A good example is "internet forum", one of the best ways to share and get information on Internet. If you are a programmer, you will probably ask questions on forums. If you know the answer of a question, you will probably answer this question if the fact that you answered is worth the time you will spend on it. You are networking the exchange knowledge with a group.

**Share help / Expert sharing:** You can share help. For example, a programmer can help one of is friend to debug his computer and his friend can help the programmer to repair his car. Both people are winner because complicated tasks are done by expert in their domains. So the time needed to do both actions is less than the time that would have been needed in case of both people doing their tasks by themselves.

**Share information and secrets:** Networking is a good way to be the first to know information. Before information is public, information is first shared in a little group. This information is sometime given away to close people of this little group. If you know that a company will go on bankruptcy, you will probably say to your friend that it would be a good idea the sell their shares. (Even if this is illegal)

**Share contacts:** You can share contacts and meet new people, for example some of us have met their partner through a friend. It was that brother or sister of a friend of one of our friend.

**Share advantages:** If you are networking with someone, you will get an advantage and he will get an advantage. An example is taken from the freemason. If you are freemason and are looking for a hotel, you will probably take the hotel owned by a freemason. The hotel owner will propose a discount because you are a freemason. Both people are “winning”, the hotel owner because he has one more trusted guest and the guest because he gets a special discount.

**Share fun:** Sport is a good example of shared fun. Going out is another example. When you play football, you share game with people, so you come closer to these people and are networking. Golf is the perfect sport for managers because you are playing and having fun, but in the same time you can talk to others people, so network with them.

**Way of trust:** Network is a good way to trust other people. If you know someone that knows someone, this is a good way to trust someone you don't know directly.

What happen if one of the two people is “Schmoozing” [6][7]?

Schmoozing has the connotation that you are getting something from someone with no benefit to the other person. [6]

You probably have some of your “short term” friends that are schmoozer. Why do you keep them? You don't really know why because they are always here when they need you and always busy when you need them. If you don't have any advantages in a relation, you give your time to others relations that are benefic for both people.

Most of the time, people want things from others people but they forget one thing. What can they give to the others persons involved in the networking process?

Networking is a bi-directional relation. You give advantages but this person also get advantages is a way or another. This is nowadays one of the biggest failures in social networking. People want something from other people but don't give anything to others people.

This is the main problem in strategic networking, particularly in business. Strategic networking is most of the time unilateral. One person needs another person, but the other person doesn't need the first person. The best strategic "networkers" know how to "share" an experience so the "networked" doesn't feel that he doesn't have any benefit.

## **2.4 Where does networking occur?**

They are place where you can network, and they are place where you cannot network. If you are in a busy environment or a very quiet environment (church), you physically cannot network. If you are in a bar with music at a low level and good fraternity, this is one of the perfect places to network.

Here is a list of networking places. This list was taken from a reference [5] and has been extended.

**Sport Club:** Sport is a great way to break the ice between two people. Sharing a common passion is great. Golf is a good example of sport for managers.

**Interests:** This is often how business relationships begin. People have a common interest and it end up with a business relation.

**Nonprofit:** These people share a common interest but come from many different industries. This is very interesting because all social categories are represented in a nonprofit organization.

**Religion, Politics:** This is a very strong networking domain, but it could also be a very poisoning domain.

**Family:** This is all your relatives. It is perhaps the best way to meet others people.

**Neighbors:** This is the persons who live near you, most of the time you don't even know them.

**Business:** This is an excellent resource. The colleagues of your past are an excellent source of information directly into a company.

**Alumni:** This is all the schools you've stayed in touch with people. There are many people that can be an opportunity for you and vice-versa.

**Internet / Technological:** There are now many opportunities on Internet to place the basis of network. We can enumerate forums, chats, communities, games, RP, and networking web sites.

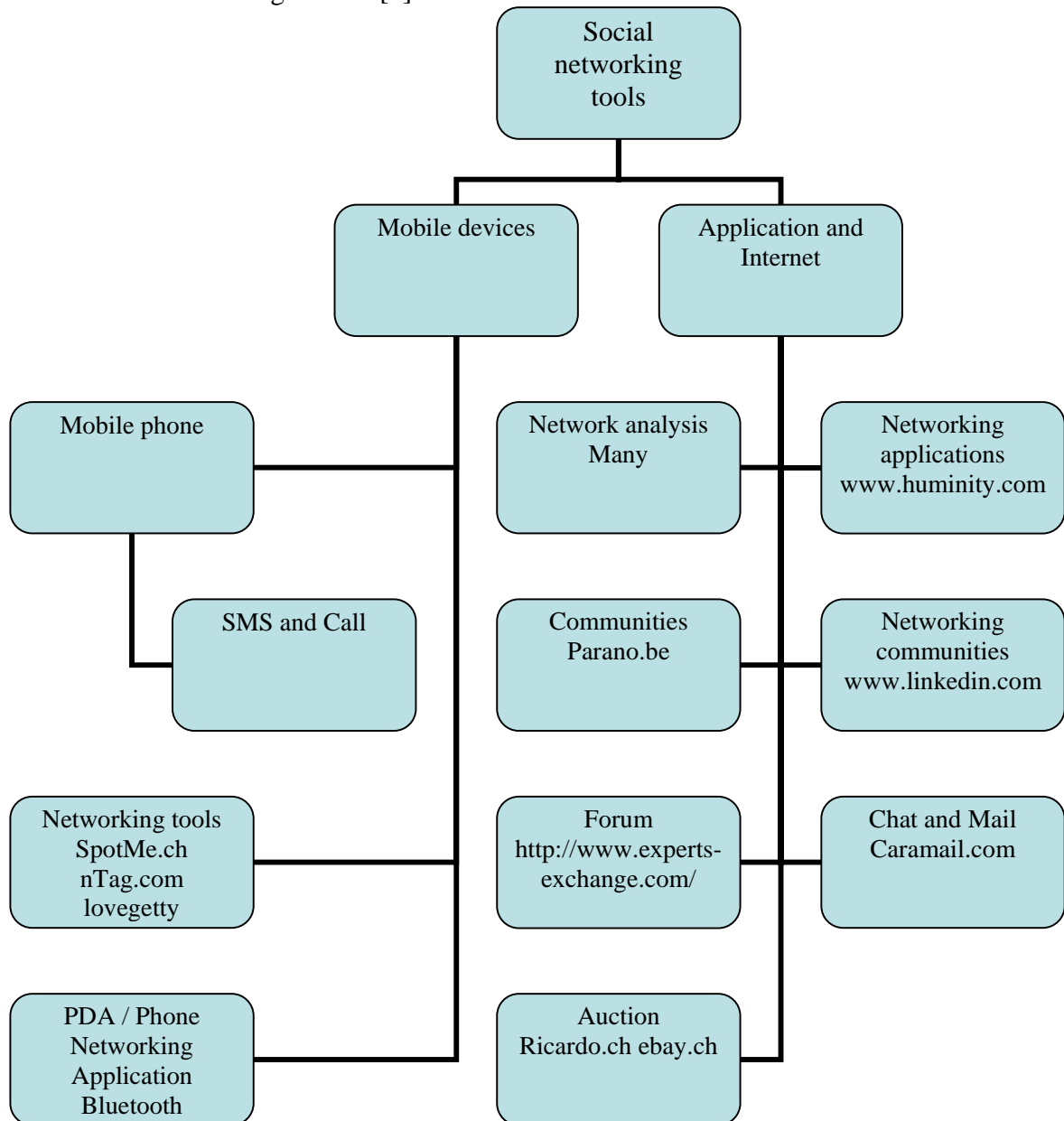
**Public places:** When you are in a public place, they are many opportunities of networking.

What will interest us the "strategic" networking. We will focus on technological networking in this project.

## 2.5 Social networking tools enumeration

What are Social networking tools?

Social networking tools are “gadget” you can use to share communication with others people using a computer or technological device. We can separate Social networking tools in the following domains. Most of the social networking tools are overlapping one or more of the followings fields. [0]



*Note: This draw is incomplete and fast evolving.*

We can separate “Technological networking” in two fields: “Mobile Devices” and “Application and Internet”.

**Internet and Applications** are computers and websites. It means that you have to go to the device to use it.

**Mobiles devices** are things that you wear with you, like a PDA, mobile phone. Both technologies are currently merging in one device. We can enumerate some interesting devices dedicated to social networking like SpotMe and nTag.

**Mobile device solution:** The advantages of a mobile device that is on each participant are that you can contact everyone and the system can connect all participants. A mobile technology can even be used outside the campus. The major problem is that you cannot distribute a mobile device to everyone due to the price and autonomies constraints, so you must use the current existing hardware of the participants. If you do so, you don't have control on the hardware and software. Some people have a PDA with Palm OS and others have a PDA with Windows CE. Some of these PDA have networking capacities like Wireless LAN, Bluetooth and Infrared, but even infrared is not always compatible between different products. The problem is even worst with mobile phone. Some have Java, some have Symbian OS, Some have Windows CE. The solution to distribute a mobile device like SpotMe cost too much and is not possible due to the amount of problems it will create. SpotMe also means a heavy infrastructure and lot of problems inherent to mobile technology (like battery duration).

The only standard is the SMS feature of mobile phone. The majority of participants have a mobile phone that can receive and send SMS. SMS can be fine in controlling the application that is in a demo mode or to set the proposal of a meeting.

Applications and Internet have the advantages that we have a more or less good control on the application and hardware of the participant. They also have the advantage that the user who is using the application does it deliberately. It means that he will use it in a time that doesn't bother him, in a slot of time dedicated for the application. The participants always use the application when they are in a good mood, when they are in a mood of doing networking. We have already seen that networking is proportional to the mood of the participant.

In our project we have decided to take the “Application and Internet” approach. SMS feature of mobile device will be used in the future to interact with the system.

## **2.6 Developing our social network using mobile device**

How can a mobile device be used to develop our social network? In this section we will enumerate different approach where the social network can be started and developed by the use of mobile device.

Everyone have a **mobile phone** and each mobile phone has the **SMS feature**. SMS is a great way to network and to keep contacts with your friends. You send a message to another person, and this person read the message when she is ready to read it. You can tighten your network easily using SMS, you can stay in touch with many people in a short frame of time. We can also enumerate many (expensive) services to meet another person using SMS.

In the “Mad” dance club, they have done an interesting event. People write their phone number on their shirt and other people can send SMS to this person. It was an evening specially dedicated to dating. This event was interesting because mobile devices were used to initiate a relation between participants.

Nowadays, **mobile phone** can be easily **tracked** by your operator. One example of service is “FriendZone” from Swisscom. With FriendZone you can receive a SMS if one of your friends is near you. You can consolidate your current network using this technology.

In the future, this technology will probably be used for dating. You enter some information about you and what kind of people you are looking for. If there is a match near you, you will both receive an invitation per SMS.

We can enumerate two interesting services of mobile tracking.

[www.findamobile.com](http://www.findamobile.com): You can track your mobile using this website. Useful for example if you have lost your mobile phone.

[www.swisscom-mobile.ch](http://www.swisscom-mobile.ch): An interesting service is “FriendZone”. With FriendZone you can find out at any time which of your friends is nearby at the moment or where your friends are hanging out at the moment. You can also chat and get to know new people.

More and more **mobile phones (and mobile devices) have the Bluetooth connectivity**. With Bluetooth you can detected others Bluetooth device who are around and share data with these devices. We can see some applications that are using this feature to help people networking like Jabberwocky and pMatch.

<http://www.urban-atmospheres.net/Jabberwocky/info.htm> : Jabberwocky is a freely available mobile phone application designed to promote urban community connections and a sense of familiarity, anxiety, and play in public urban places.

<http://www.hpl.hp.com/research/idl/projects/mobile/> : pMatch allows 3650 owners to learn of others with similar interests or information, without revealing their own personal, private data.



Some applications have been developed on a **dedicated hardware**. These devices have a description of the participant and what interest the participant. When a device detects another device, they share information and if a matching is found, warn the participant that there is someone that might interest him. Some of these devices can also be used to scan participants who are around. We can enumerate LoveGety, SpotMe, nTag and some others.

**LoveGety** is called a fish finder for humans. The gadgets beep when they detect other Lovegetys within a 15-foot range.



LoveGety is not any more available but was widely available in Japan.

**SpotMe** is a great networking device developed by ShockFish that help networking between participants of meetings. With this device you can scan who the people around are, answer to survey, send messages, share visit cards and do some others actions.



<http://www.spotme.ch>

**nTAG** is a less powerful but similar product than SpotMe. It provides a complete event communications system for forward-thinking business and social gatherings. The system is built around our groundbreaking interactive name badge – the nTAG. nTAGs are wearable computers that improve networking among event participants while streamlining event management.

<http://www.ntag.com>

## 2.7 Social Networking using fixed device & internet

In this section, we will describe some concepts of applications that are developed on Internet that can help to develop your social network.

We have already seen that

Networking is a bi-directional relation. You give advantages but this person also get advantages is a way or another. This is nowadays one of the biggest failures in networking. People want something from other people but don't give anything to others people.

This is one of the biggest problems on virtual networking communities. People are ready to “take” but are not ready to “give”. This is often one of the biggest failures in networking applications with some solutions we will see in the following examples.

We can first enumerate **Forums and Blobs**. Forums are perhaps one of the oldest ways to share information on internet. You write questions on a “Forum” and others people will give an answer to your question. One of the biggest problems of “Forums” is that networking is a bi-directional relation. You ask questions, but you must also answer questions to have a forum that “work”. One of the solutions of this problem is given by [www.experts-exchange.com](http://www.experts-exchange.com). Experts Exchange is a Patented Knowledge Sharing system that enables experts to compete and collaborate with each other in the process of solving other member's problems. You can buy your admission, or you can get points by answering others people questions. This is a good way to resolve the “bi-directional” problem of networking.

**Emails and Chats** are two technologies that are very popular. You have the opportunity on many websites to have free emails and access to a chat. A chat is a way to share messages in real time. Community is developed through the “chat”. You give some information about yourself like you nationality and age. You can find others people using these information's and “breaking the ice” and starting a relation using the chat. The mail can come in a second step to make this relation stronger.

As an example, we can give [www.caramail.com](http://www.caramail.com): This is a free email address but also a chat used by 30'000 persons daily.

Two evolutions are interesting.

<http://www.imvu.com> is a way to display message received by your chat client using a graphical display. You can see a situation with both participants of the chat in a virtual networking environment.



<http://gmail.google.com> is also an interesting evolution of email. To get this free email address of 1Go, you need to be invited by someone (September 2004). Someone can only give a limited count of account, so your “free” account has more value and it’s a good way to fight again using an account for illegal stuffs.

**Communities** are another concept of networking that is becoming popular. Communities are website where you have an identity and a role. These websites are like a game: You play the role of someone. An example is [www.parano.be](http://www.parano.be), this website is based on a role game called "Paranoïa(tm)".

**Auctions websites** also have an interesting concept. You have to bid on things sold by people you don’t know. To trust others people, each time you buy or sell something, you have to evaluate the other person. This evaluation can be seen by everybody. It’s a good way to trust others people. We can give as an example these two popular websites: [www.ricardo.ch](http://www.ricardo.ch) and [www.ebay.com](http://www.ebay.com)

**P2P** is a special case of social network. You have to trust and share things with unknown people. You are networking with an unknown for a very limited amount of time.

Two problems have emerged.

- Many viruses and corrupted files are sent through P2P networks.
- People take but don’t give anything. A small part of the p2p networking community gives a large part of the files.

These problems were more or less resolved on “BitTorrent”. You download a signature on a trusted website and using this file, you download the file through the P2P network. Parts are taken from different users. The “ratio” problems have been resolved by advantaging “good” users and having the “Partner” concept. Partners are people that are downloading on each others. They are sharing more bandwidth because they know that the other user is a “good” user. Someone who is recognized by many as a “good” user will also be advantaged.

We can give the three following websites.

<http://www.kazza.com> : One of the most known p2p client. One of the most hated one: install it and you will install a lot of spywares.

<http://www.overnet.com> : More or less like kazza but with less spyware.

<http://bitconjurer.org/BitTorrent> : A good innovative p2p protocol, many clients are available that support this protocol.

We will finish by **Social Networking Tools**. Based on some literature, Social networking tools has emerged as a phenomenon in 2003, allowing the newly-populous Internet to serve as both a buffer and a safety net for introduction to friends by friends once possible only in person.

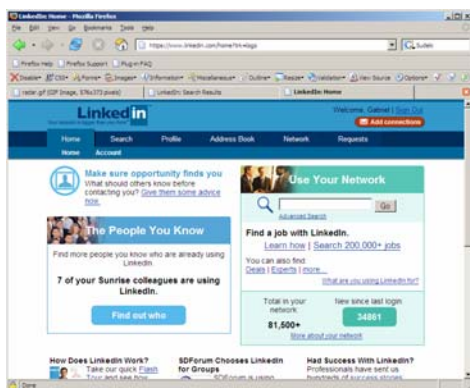
This is a great way to trust people and to find people of interest. If you know someone who knows someone who is in a company, you already have a step in the company.

Social networking tools are great, but we have seen four major failures.

- When you link to another person, it doesn't mean you know this person very well. I'm linked to people I know, I know they are great, but I don't really know them.
- Making links between people is too formal.
- You are linked only by friend. It could be nice to be linked by company and others fields. This is something we have developed in our application to make a less formal system.
- A degree is the number of people between you and another person. I think that after two degree (the friend of your friend) the utility of this application degrade rapidly. Would you introduce the friend of your friend to another of your friend if you don't even know this person?

<http://www.huminty.com>: A social networking applications wish you can use to navigate through your friends and the friends of your friend.

<https://www.linkedin.com>: A social networking website.



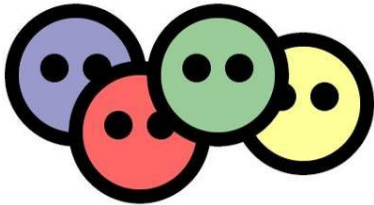
*LinkedIn Screenshot*

**This is my LinkedIn connection**

<b>Your Connections</b>	13
Your trusted friends and colleagues	
<b>Two degrees away</b>	66
Friends-of-friends; each is connected to one of your connections	
<b>Three degrees away</b>	1,300+
Reach them through a friend and one of their friends	
<b>Four degrees away</b>	21,700+
The broadest group, reach them through a chain of referrals	
<b>Total users contactable through a trusted referral:</b>	<b>23,100+</b>
Your network also includes 67,700+ user	

**Foaf, a p2p view of social networking tools.** FOAF (Friend of a Friend) is an RDF application used to describe people and their interconnections and relationships. It uses XML syntax. This vocabulary is defined using OWL (Web Ontology Language). This is a file that contains information about you and link to others FOAF files. This is a good way to describe your network without relying on a central web site.

<http://www.foaf-project.org/>



This technology is still immature. We have tested a FOAF parser in our project.

We are highly interested by the social networking tools and our project will use this concept and try to remove the defaults we have detected in social networking tools.

## **2.8 How to trust an unknown person**

To trust someone, we need to see this person and have good experience with her, or we need to know that someone has some good experience with this person. You probably trust your friend because you know that if you give them something, they will give it back to you. You know by experience that what you are waiting from your friends is what will probably happen. But what will happen if the other person is a stranger that we only know through Internet (for example), we need a way to trust this person.

We can **trust with the help of an authority**. If we know that each participant must be serious to belong to the community, we can trust members of the community. For example if you are in a charity community, you can be fast certain that others members will not fool you. You think that all members of the community are sharing common basic rules like: “You will not steal to your neighbors.”

We can **trust with the help of the members of the authority**. We base our opinion that a majority of people are honest, so in many auction websites, you have the possibility to write the result of the transaction. This result can be seen by everyone. If the transaction was successful, you can write “success”. If the transaction was not successful, you can write a note about the seller or buyer warning others potential buyers or seller. The more positive annotations you have, the more trustable you are.

We can **delegate the trusting to someone you trust**. If you can trust one of your friend and this person trusts another friend, you can trust the friend of your friend. This is one of the reasons of Social Networking Applications. You trust others people by delegation.

We can also **trust by sharing experience and moment of life**. If we share an experience with someone, like football playing, long discussions on Internet, we can get an idea about this person, so we think that we can trust the other person.

Good non-technical networking communities are secret societies. To belong to the community you must prove that you are sharing their idea, you have passed some test and you have proved your integrity. The membership to the community has more value than the “risk” you take by trusting this person.

Trust doesn't mean global trust! Most of the time trust means partial trust. You perhaps have good friends, but you won't give them a penny because you know that they will never give back this penny. With some other friends, you won't share a secret because you know that everyone will know this secret. We see here two cases of incomplete trust. This is one of the reasons of a failing trusted network. One of your acquaintances can trust someone, but not in your way of trusting. Example: “Yes this is really a cool guy!” But you don't know that you must never give money to this person.

The power of trusting someone through a community or acquaintance is that you can use the community/acquaintance as a means of pressure if you have been abused. If someone in your community fools you, you can say to other people in this community that you have been fooled.

## 2.9 Communication and technology

Does technology really help networking?

What is better? Communicating using a computer or face to face interaction?

Based on a study by James McKenney and Associates, the difference in how managers use “face-to-face” and “electronic mail” media is [9]

- *Managers use electronic mail for efficient communication in well-defined contexts – monitoring tasks status, coordinating efforts, exchanging factual information, sending alerts, and broadcasting information.*
- *Managers use face to face interaction for defining and discussing problems and solutions, building a shared understanding of the situation, discussing shifting priorities and external pressures, interpreting ambiguous signals, and socialization of members.*

We can see that electronic communication is efficient, *but only face to face interaction provides the richness, interactivity, immediacy of feedback, and social context for complex problem solving and fostering a shared set of values, beliefs and meaning.* [6]. A face to face interaction is a lot richer than an interaction using mail. You can see the figure of the participant, the belonging of the participant. This is all a speech that is not transmitted by classical technologies.

We can also see that **Electronic interaction could be a great medium to initiate, sort and set the basis of a “Networking communication”, but Electronic interaction cannot replace face-to-face interaction.** The speech given by the mimic of the participant is also part of the necessary steps to trust someone.

We don't have time to network with everyone. The technology can be a way to focus on people that interest us, extract people that might interest us in a face to face communication. We can “see the invisible” by using technology.

Conversations between managers (and other people) that want to develop their network follow these steps. [0]

**[Introduce] -> [Break the Ice] -> [Interesting discussion] -> [Share visit card]**

First people are **introduced**. It can be by the mean of a third person or by a (more or less wanted) “accident”. The person that want to make a discussion with the other person first try to see if the other person is in mood of speaking. Example: “Oh you are not working for Microsoft?” – “No at all, but you are?”. The discussion can then go in the “Break the ice” mode.

**Break the Ice** is a way to confirm to both people that they can share a moment of discussion. This is also a way to go to a larger and more interesting discussion. Example: “Nice weather isn’t it?” – “Yes, I will perhaps play gold tonight” – “I really like golf”. We are ready to go to the 3<sup>rd</sup> part, sharing an interesting discussion.

During the “**interesting discussion**” phase, we share information that strengthens the conversation.

**Share Visit Card** is a way to end the conversation and saying that both participants can meet again later.

Technology can also be a way to “break the ice” by helping people that want to find new friend/contacts to find what interest people share and so find a way to start a discussion. If both participants like tennis or have been in the same school, this is a good start of starting a communication, so starting to network. They have a common interest, so a subject that will interest both people.

In the same time, using technology you already know all the basic information on another person. Basics information’s are most of the questions that are used just after having met someone to “break the ice” and go in a real interesting discussion. So the technology must be “Enough” but not “Too Much”, or you must find another way to “break the ice”. Having a system that is too exact will remove interest and possibilities of starting a communication. [0]

If you discuss with a stranger, one of the first question will be: “What is your name?” or “The weather is nice”. An uninteresting start of a discussion, but also a good way to “break the ice” and find a discussion that will interest both people.

Technology can help communication, but too much technology will disadvantage communication. Technology cannot replace face to face meeting.

We will present a situation where networking tools is a protection again communication. An interesting usage of networking devices (like a mobile phone) is to protect yourself again others people that are interested in networking with you. We can take the example of mobile phone. Have you never started to write a SMS or calling someone with no reason, just to show to others people that you are currently in communication with somebody? That is a good way to show that you don’t want to be disturbed. [0]



## **2.10 Time for communication**

There is time for communication... and time not for communication.

You have probably heard a phone ringing at the worst moment, for example during a wedding or a very important meeting. Someone wants to communicate with somebody of the assistance, but this is definitely not the right time.

Having another way to disturb people is not a thing to do at IMD school because people are really busy and not in a mood to build their social network during the majority of the time. Many managers use breaks to contact their company and don't want to be disturbed by mobile devices.

An interesting moment is the dinner, but when they are eating or taking a break, they are probably already building their social network, so we don't want to disturb them. Another moment is during the breaks, before the program and after the program. Some participants will use these moments to test the applications.

Having an application that is not mobile is interesting because people will be in a good mood for starting social networks when they use the application. They use the application BECAUSE they want to find interesting people and because they have time to use the application.

## **2.11 Distance and communication**

What we will develop in this section is the relation between distance and networking.

In our case, people share a common space: the campus, but they are clustered in programs. They stay in groups of about 40 participants.

According to the Euclidean definition, distance is "The length of the shortest line segment joining the two points".

Distance is an important factor in communication. People will better communicate with people that are near them. If you don't share space with someone you physically cannot communicate. Have you ever tried to communicate with someone who is one kilometer away? This is simply impossible without using technology. You have to shout.

Now what happens if both people have a mobile phone?

The communication will be easier, because you can share messages. A possible way to communicate is using technology: phone, email, games, and many other devices. For example, with a mobile phone you can communicate with someone that is on the other

side of the earth. You stay connected with all you contacts, you are VIRTUALLY near everyone.

Don't we say "The global village" when we are speaking of Internet?

Distance is also a way people perceive the distance. We can give a citation by Bradner and Mark [10]: *"Subjects are more likely to deceive, be less persuaded by, and initially cooperate less, with someone they believe is in a distant city, as opposed to in the same city as them." We see that people "perceive" they live in a long distance, so the psychological distance is longer. Perception can also be difference of the social status of "how you consider yourself". If you take one person that believes in Christ and one that Moslem, they will consider themselves in a larger distance than two people who believe in Christ. We can see the same difference between a manager and a CEO.*

The psychological status of the participant can also be considered as a parameter of a distance. Someone who is in a bad mood, stressed, will be less motivated to communicate and develop his social network. If someone is in a "positive" environment with many known face, he will be in a better mood to meet new people.

But a bad mood could also be seen as a way to communicate. If you share your pain with someone, you start to integrate this person to your social network. We can see that in major disasters. Everyone wants to help. Everyone wants to communicate and share pain.

We have also used the technology so people will be aware of the others people that are on the campus.

## **2.12 Privacy**

You have probably been on amazon.com? If you search for something, you will probably see this text "Customers who shopped for this item also shopped for these items". If you see the articles that are proposed, most of the time you'll be interested to buy one or more of these articles. It looks like a great feature, but in the same time you loose your choice to choose. The worst of all is that in a way you look at what others people do.

In a more standard situation, if you live in Switzerland you probably have one the fidelity card like the Supercard (Coop) or the Cumulus (Migros). These cards record what you buy and you get a 1% bonus through coupons. It looks great and like a fidelity program, but in the same time, what do they do with these records? It would be great for them to analyze these records. They can then do some targeted marketing. If you stop buying cigarettes and start buying children stuff, they can deduce that you will soon have a baby. You will perhaps receive a special insurance for children or some rebate coupon for child related stuffs. What they really do with these data is not really known. [2]

**An interesting effect is when the matching gives inexact results. This situation can be really annoying.** On Amazon, if I'm interested by books related to wine, the system

will perhaps propose books to help stop drinking. An interesting annoying case is in reference [1]. As an example, in my system, it can be very annoying (and an explosive situation) for a participant that is in the “experiment on animals” domain to be related to someone that is a “protecting animals” domain. In the same time, this case could be an interesting solution because both participants could be interested in having a discussion to find compromises between the two domains. I have removed from my system matching by picture (you look like) and by birthdates as these data can be annoying. You will perhaps not accept to look like another person.

Privacy doesn't seem to be a big problem for people in general. They are even ready to share more information. Based on a study on “IntelliBadge” [3], a matching device, only 32 users out of 6000 have looked at the page about privacy. **Privacy is a problem when people begin to disturb others people using private information. (Like spamming or advertisement.)**

Our approach to privacy is to give people the possibility to be in or out of the system and there is no possibility to take the list of all users easily. Anyway all the information we provide using the system is already available on the Intranet Web site for all participants that will access the application.

### 3. Objectives

Developing his social network is seen by many references in the literature to be one of the most important parts of any manager's job. **When we begin a job as a manager, technical skills are sufficient, but when we move up, success depends more and more on relationship skills.** [6]

To build these relationships managers need a way to meet other managers and people. They do it in various ways and in particular they find good networking possibilities when attending workshops, events and programs designed for their professional interest. IMD is a great place for managers: in a delimited frame of time and space they can meet other managers. They can share knowledge at a professional and/or personal level with other people.

IMD is one of the world's leading business schools and as such it is perceived as a **global meeting place**, a place where managers from medium and large international corporations meet.

In general there are two types of social networking and IMD is not an exception when it is about these types of social networking: Serendipity and Strategic. The two types of networking are not well defined in the reality. People are more or less in a type of networking, but are still between the two types of social networking.

**Strategic networking takes place when managers know what they are looking for and for what purpose.** They want to find the people they need, they are looking for specific contacts. The success of their experience on campus is proportional to the number of new business contacts they have made during the time they spent at IMD. IMD wants to help them to find new opportunities.

**Serendipity networking occurs in a more fortuity manner, when people meet by chance and share common interests.** Many participants at IMD would be pleased to know new people but that is not what they are searching for. IMD wants to show them that there are plenty of opportunities of networking and that they are also here to meet other people. IMD wants to encourage managers to meet other people.

Most IMD programs are designed for groups which average 40 participants with a tied agenda, this setup makes difficult for any given participant to realize who else is on campus at the same time and what the networking opportunities are. One way to help is to make people aware that they can meet people who are in another program, to show other people. One way of shorten the distance between people is by the use of technology.

We will show to participants that they are in a community and that they have a lot of networking opportunities. They have a limited amount of time, but during this time they have the possibility to widen their social and business network. They have a limited amount of time also means that they don't have the time to meet everybody. We want to restrict (not to limit) meetings on people that can be interested in meeting each other. Another idea of this project is to **develop in the manager memory a representation of who the people around are.** If they see a group of people that are seated together, we want that manager think ideas like. "Oh this is the group of Belgium I've seen on the application!" IMD wants to hear more comments like "Look these people here are the people from this company"!

In this project we want to speed up this phases. If you are aware who the people around are, you will also be more comfortable and be in a better mood of communication..

Having a representation of which the others people are is also a way to engage a conversation. If you know that someone is in your domain, you will have an argument to start a conversation. "I've seen you on the IMD application. I'm also an IT manager!"

We have decided to use technology to help people to better network.

**What we want in this project is to make something more natural.** We want to help people to build a relation but in a more natural way, this software will not replace face to face interactions. **Technological interaction can help to start a social relation, but only face to face relation can "set" the relation. We don't want a system that is too formal.** We want to give the possibility to participants to choose what they want to view. **We will give them "their own view" of the network.**

We have found two types of technologies that go in this direction: social networks software, networks where you defined who your friends are, and social analysis software, software used to analyze a network of people.

The problem of “social networks software” is that these software are built on the “who know who” idea. You can see a “real” relation between people but that’s all. We are also interested to see a more abstract view of social network.

Social Analysis software’s are great to do that, but there is no real time interaction with this kind of software.

We have decided to build a real time system between the two systems. We haven’t found any existing system that is a mix of the two concepts.

How can we help managers to better network? We will focus on the following themes:

- How can we help the strategic managers?
- How can we help the serendipity managers?
- How can we speed up the process of accommodation? The time needed by managers to feel at ease.
- How can we advertise IMD as a “global meeting place”?
- A software that is more natural, that look less formal than current systems

## 4. Context

We will describe the current context and constraints of our project.

### 4.1 Who is IMD?

<http://www.imd.ch>

IMD is a school of business in Switzerland, Lausanne.

It is one of the world’s leading business schools with over 50 years’ experience in developing the leadership capabilities of international business executives at every stage of their careers. The majority of the program participants come from medium to large corporations and all have an international orientation to their businesses. Many companies, who begin by sending their managers to IMD programs, go on to develop their relationship with the institute to a closer level and become part of the IMD Learning Network, which provides still further learning advantages.

One of the major programs of IMD is OWP. OWP is a program axed on making contacts between participants.

This is the description of the OWP program.

Keep your finger on the pulse of global business. In just six days IMD's Orchestrating Winning Performance (OWP) program provides a concentrated update on critical management issues of the moment:

- Discover and learn - You customize the program content to suit your requirements, so you get exactly what you need
- Connect with the cultural and professional diversity of your fellow participants in a stimulating knowledge-stretching environment
- Benefit from never-seen-before case studies
- Challenge your current thinking and add volumes to your knowledge bank

(<http://www.imd.ch/owp>)

OWP are about 400-500 participants that meet on the campus.

## **4.2 Constraint**

IMD is interested in building the system in an incremental way. They first want to use the current existing infrastructure and test the application. If the participants show a good interest, they will extend the features of the system.

We currently have the following available infrastructures.

### **Software and database**

- We have a database (Siebel) that contain all participants and basic data on the participant like first and last name, email, currently followed program, activity sector, the name of his work, his activity domain, his position, his company, his country. This database can only be modified by IMD staff.
- Another database can be updated by the participant. There is a portal on IMD website where the participant can update data related to his profile. He can for example put a photo of himself.
- All computers are running Windows XP and Windows 2000.

### **Hardware on IMD campus**

- Cybercafés are available in a lot of places. The participant can login to Cybercafés to check his mail for example.
- Flat screen are available in many place and many information are displayed on these flats screens.

### Hardware by Participants

- A large majority of the participant have a mobile phone. The feature that is available to everyone is SMS. Some phones have Bluetooth feature.
- A large majority of the participant have an Email address.
- Some participants have a PDA that is running Palm, Symbian or WindowsCE operating system.
- A badge with the name and company of the participant.

### Hardware in the future

Hardware that could be bought in the future to extend the application

- Webcam: With a webcam we can do video conferencing between multiple computers on the campus. We can also recognize more or less participants using face recognition or badge recognition.
- Badges on the participants: We can distribute to each participant a customized badge that can be recognized by a RFID reader or by a webcam. If we put a special picture on the badge, the badge can be recognized by a webcam. [11]
- Method of authentication on each cybercafé. Participants authenticate themselves using a password, but we can imagine having a “customized” USB key that contain all login information and data about the current network of the participant. This USB can be plug in a computer to see the CV of people we are interested to contact and screenshot of interesting networks.

## 4.3 Requirements

In this project we have three types of customers. We will define the wishes of each of the actors.

### 1. IMD as a company / Business Requirements

We will evaluate the business requirements. What IMD wants?

One of the uses of IMD programs is to help participants to develop their social network. We can see the importance for participants to develop their social network with the success of some programs like OWP 2004 and particularly with the success of the SpotMe device. [12]

IMD wants to be “**The global Meeting Place**”. They want to reinforce their position as a **meeting platform of managers**. To do so, they have constructed a new learning center building that will be more focused on helping people to communicate, so to extend their social network. This project is also a part of this reinforcement. One of the concepts of this software is to show to participants that they are in an ideal environment to meet new people. IMD wants to show to participants that there are more opportunities to develop their social network than the 40 participants of the program. Participants make contacts with others participants that are following the same program, but they don't make

contacts with others participants on the campus. IMD also wants to show to participant that there are people that might interest them actually on the campus.

If we look at the description of the OWP program, we can read: « *Connect with the cultural and professional diversity of your fellow participants in a stimulating knowledge-stretching environment* ». Social Networking is a **marketing advertisement** for IMD.

## 2. Participants of IMD programs / User requirements

We will evaluate the user requirements. What do the users of the system desire?

Participants don't have much free time. We don't want to disturb them with fancy gadget

We have seen that they are two types of participants: Serendipity and Strategic managers.

Based on some interview, one of the missing things in OWP and the internal website was the ability to find others people easily based on management domain. Martin: "*The people that interest me were IT Managers.*" We are here speaking of strategic managers. Strategic managers are interested in finding people that match a specific profile. To find for example people that lives in Switzerland and is in the IT Domain.

Serendipity manager are less aware of the Networking opportunities of IMD. They don't search for a specific type of participant. We want to show them participants that are currently on the campus and show them interesting group. We want to give them the envy to network and make contact with others participants.

Participants are also interested by finding a way to be introduced to these people. They are also interested by a way to "break the ice".

## 3. EPFL / Craft

The EPFL is interested in studying a less formal way of social networking using technology. To see the concept of a system that is more like human do networking.

## Conclusion

This is what we are waiting from the system.

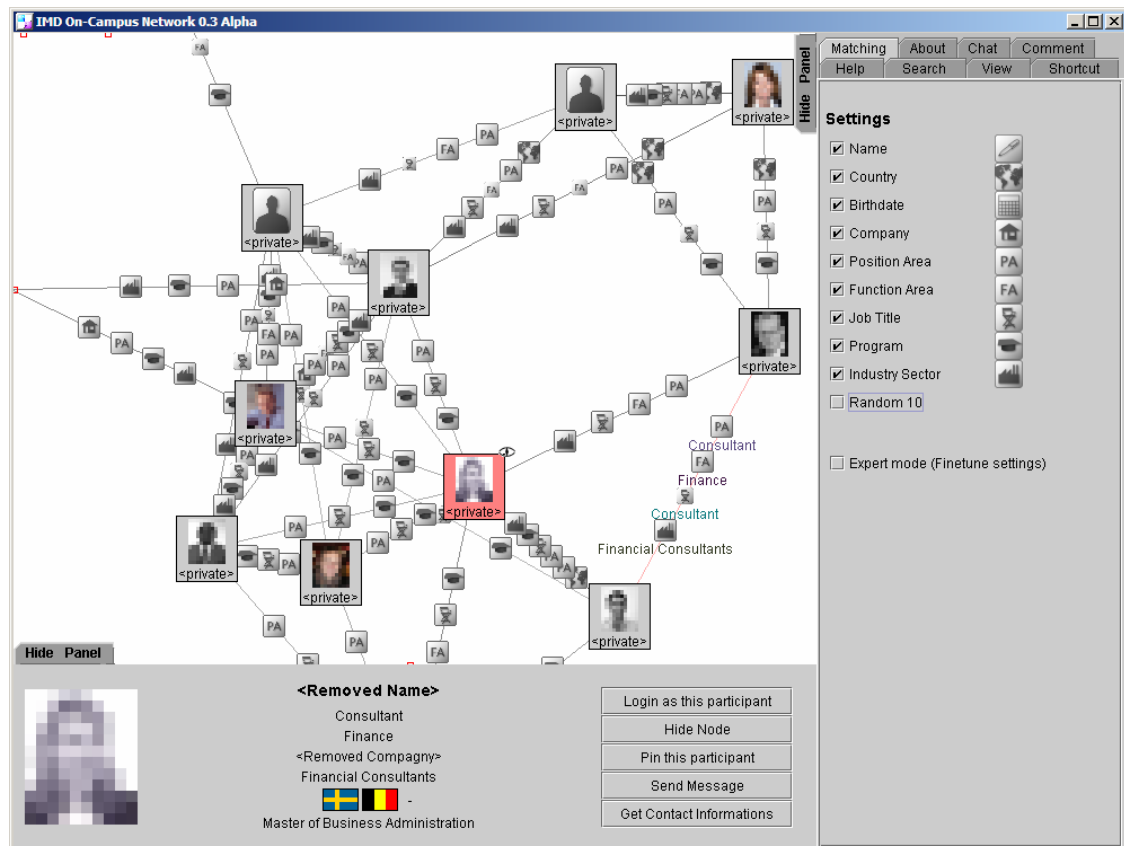
- Show to participants that they are in a community and they have a lot of networking opportunities.
- Give the possibility to participants to find easily people they want to meet.
- IMD wants to be a major actor in the social networking field.
- Participants are interested by finding a way to be introduced to other interesting people, to find a way to start a conversation with people they want to meet.
- Finding a less formal way to meet others people.





## 5. Solution

We have developed the “IMD Networking application”. With this application participant that are on the campus will be able to view, search, chat and meet others participants in a innovative way.



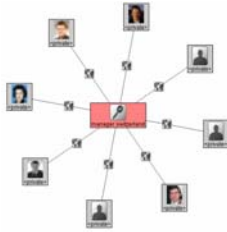
### 5.1 Description of the Solution

We have developed the “IMD Social Networking Application”. This application contains all participants that are currently on the campus.

Someone who is on the campus can go to a cybercafé and start browsing the application.

We have seen that we have two types of participants. We have the participants that are here to find opportunities and are searching for specific profiles. We have others participants that are here by curiosity and will be interested in seeing who the people on the campus are.

**Strategic users:** Strategic users are here to find a specific profile. They will for example search for people that live in *China* and are *IT Managers*.



They will first enter “China” and “IT Manager” in the search box. The “search” will appear in the center of the screen and participants that best match will be linked to this search node. The strategic users will then start to navigate through the different participants. When they have found someone that interests them, they can send a mail to their mailbox with information about how to contact this person. They can also send a mail to this person in which they propose a meeting.

**Serendipity users:** We want to interest the serendipity users by the game side of the application. Serendipity users that are here by curiosity will browse more randomly. They will search their name, search people from their country and in the same business domain.

We expect them to say: “Oh! These people are from the same country than me!”

The application is here to give them the wish to meet others people to show them that they are in a social networking environment, to give a nicer ambiance between participants.

The chat (not yet implemented) is also a good way to start a communication with others users of the application. They will “break the ice”.

**IMD as a networking place:** Users of the application can view all IMD participants that are currently on the campus. Users will be able to meet people that are in a totally different place. IMD has extended the “Networking place” from the program and people in the program (40 people) to people in all current programs (300 people). We have “virtually” shorten the distance between participants.

There is a “Demo” mode that will be displayed on the Flat Screen. Selection of the current node is random and links between nodes are chosen randomly. The demo mode is here to show to all participants that they belong to a community and showing networks that are currently on the campus. Participant will feel that they are in a community.

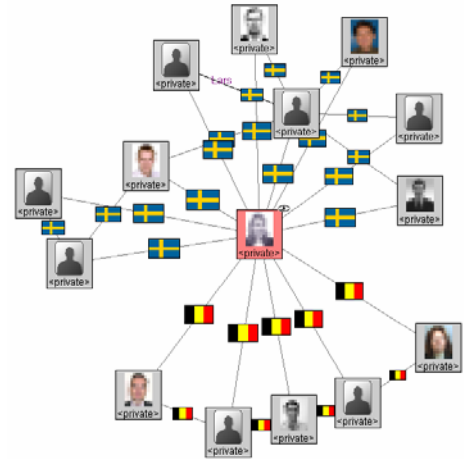
## 5.2 Screenshot

This application is a visual query builder with many interesting features.

### View the network.

By selecting a participant, we can see the people that are linked to this participant based on the criteria of our choice.

In this example, we have selected the country as a link between participants.



This screenshot represent one of the control panels.

Here we select what criteria we want to use to link participant.

With the advanced mode (right panel), you can give different weights to different criteria. (Not only “on/off”). You can give to country a larger weight than for job title by example.

<input checked="" type="checkbox"/> Name	
<input checked="" type="checkbox"/> Country	
<input type="checkbox"/> Birthdate	
<input type="checkbox"/> Company	
<input type="checkbox"/> Position Area	
<input type="checkbox"/> Function Area	
<input type="checkbox"/> Job Title	
<input type="checkbox"/> Program	
<input type="checkbox"/> Industry Sector	
<input type="checkbox"/> Random 10	
<input type="checkbox"/> Expert mode (Finetune settings)	

Name	
Country	
Birthdate	
Company	
Position Area	
Function Area	
Job Title	
(Program)	
Industry Sector	
(Random 10)	

**View the profile of a participant.**

When we have selected or we have the mouse over a participant, we can view his profile.



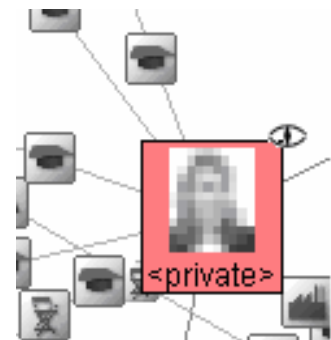
On the profile, we have a description of the participant and some more information like country, company, position and others relevant information.

We also have a panel on witch you can do “actions” on the current selected participant. You can send a mail to the participant, you can send a SMS, you can login as this participant or you can receive a mail with the coordinates of the participants.

**View others users on the network**

We can see others participants that are « logged » to one instance of the application.

To view others participants that are logged is also a way to show that you are in a community.



### Searching for a participant

We can do a search on the set. We enter some keywords like the country, the position, the name and you can see the results of the search that is displayed on the graph.

In the following example, we have decided to find all managers that live in Switzerland. We have decided to display only the “best match” of this query.

If we had decided to show the 15 best matches, people that are manager OR in Switzerland would also be displayed on the result until we get 15 results.

**Search**

manager switzerland

Name

Country

Birthdate

Company

Position Area

Function Area

Job Title

Program

Industry Sector

Show only best matches

Search

### Discussion / Chat

The participants that are logged in on the application have the possibility to chat together. They can share public and private messages. This is a good way to “break the ice”.

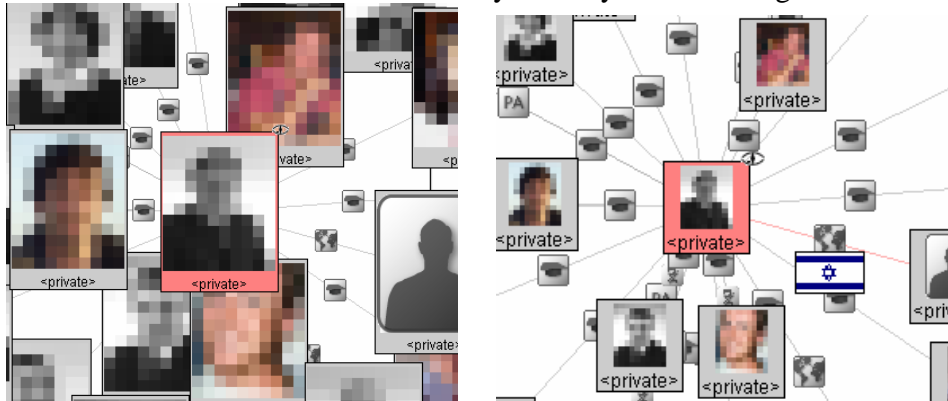
*(Note: At the time of the writing of this document, this function is not yet implemented.)*

## Multiple views

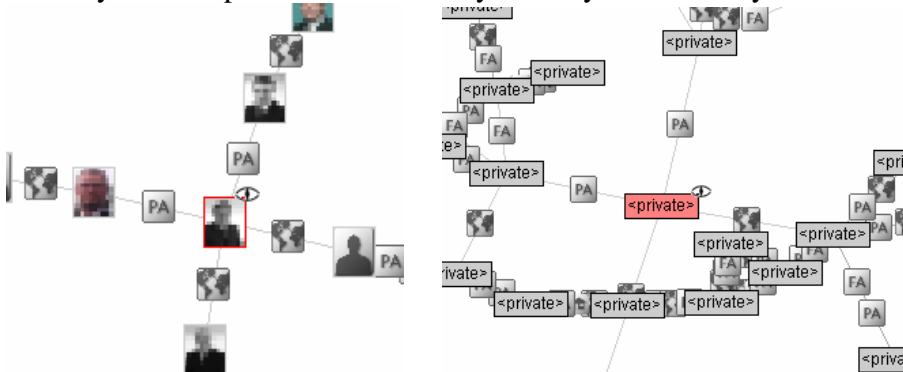
You can change the way the “participant” is displayed. If you are interested only by the face of the participant, you can select “Small picture”. If you are only interested in seeing networks, you can select “network only”. They are others display modes.

- Picture and Name
- Small Image and Name
- Small Picture
- Name Only
- Network only

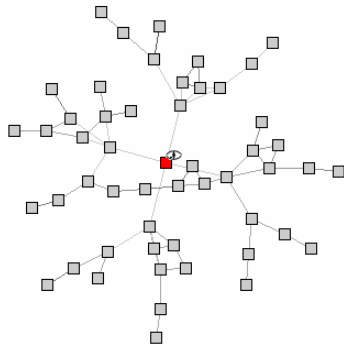
View « Picture and Name » followed by view by « Small Image and Name »



View by « Small picture » followed by view by « Name only »



View by « Network only »

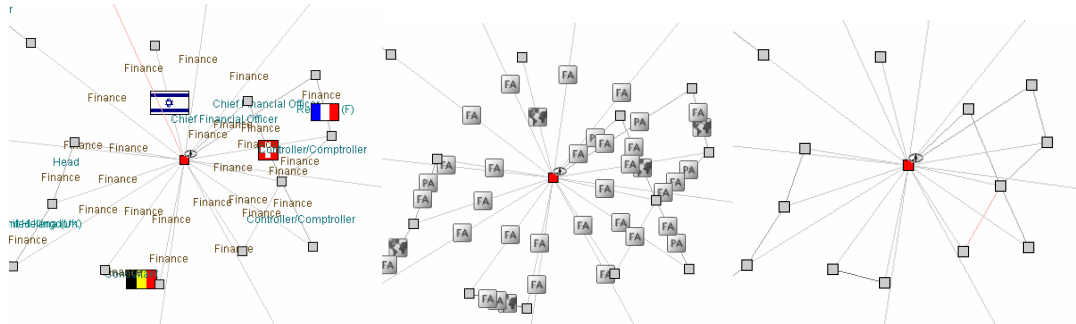


You can choose the way the link between participants is displayed.

**View Edge Detail**

- Description
- Icone / Picture
- Link only

This is the three different views.



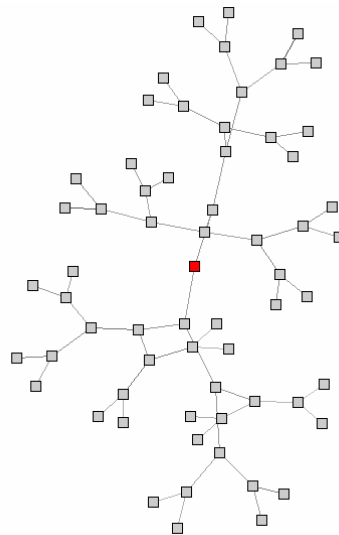
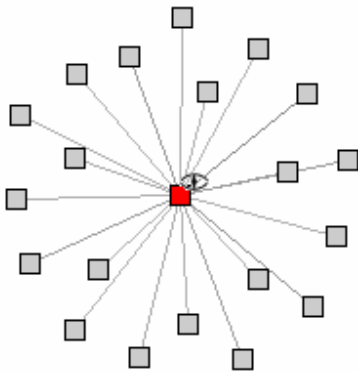
*(On the last view icon is bigger for stronger links)*



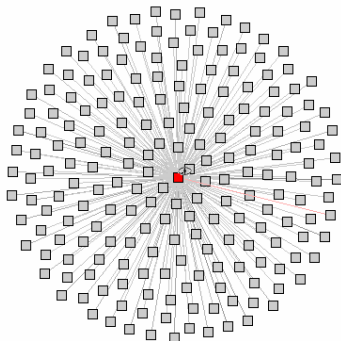
You can change the distribution. The distribution is the number of nodes that are linked to the selected node, then the number of nodes that are linked to the first generation and so.

- Classical: 1->8->4->2->1
- Linear: 1->1->.. 25 Times
- DNA: 2->2->2->2->2
- Star: 1->20
- Large Star: 1->200
- Big Bang: 1->30->5->5 (CPU)

We have chosen the “Star” view in the left screenshot. (20 participant on the main node)  
We have chosen the “DNA” view in the second screenshot. (2 neighbours per participant, 5 generations)



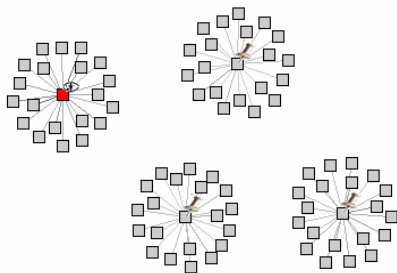
This is the « Large Star » view. You view the 200 best participant of the selected node.



**Here are some advanced options****Advanced**

- Show only best match
- Extend VIP network
- Explode (Avoid circle)

Explode will remove circle: only NEW nodes are child of a current existing node.  
You can mark a node as VIP node. “Extend VIP network” will also develop these nodes.

**5.3 Algorithms****Vocabulary**

A **Set of Participant** represents a set of objects. We have seen that this concept can be more than just a set of participants. A “set of participants” can also be all programs offered by IMD for example. In our case it will represent all participants that are currently on the campus.

A **Participant** represents an object, one of the elements of the “Set of participant”. It can represent for example the participant “Paul”.

A **Matching** is a comparison and relation between two participants. It can be the country, the birth date, a text analysis between the description of the two participants, or many others relations. A matching can be formal and return a value of 0 (not match) or 1 (match). A matching can also be informal, like the comparison between the face of two participants, a comparison of the voice of the participants.

An **Action** is something that can be executed on the Participant. We can for example send a mail to the participant. We can get the contact information about this participant. We can login using the name of a participant. We can do the action we want on the participant.

## How is the graph built?

To construct a “light” graph with not too much information we have used the following algorithm.

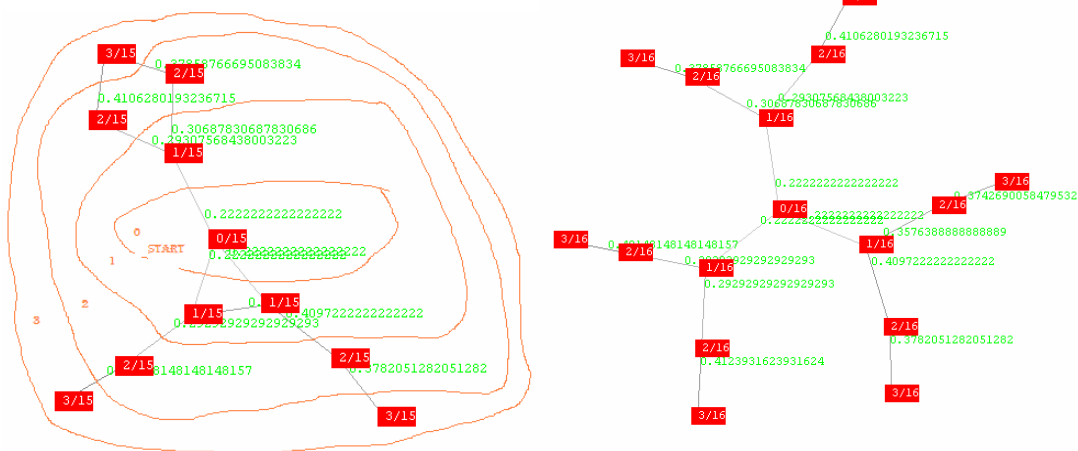
We will first define the “View”, for example if we have chosen:  $1 \Rightarrow 3 \Rightarrow 2 \Rightarrow 1$ .

The current participant will be linked to his 3 best neighbours. This is generation 1.

The 3 best neighbours will each one be linked to the 2 best neighbours. This is generation 2.

Then we will link 1 last “best” neighbour. This is generation 3.

The “best” neighbours are extracted using the “Proximity Algorithm” explained bellow.



*Note: We have used a special « explode » mode in the left picture that remove circle. Only the best 3, 2, 1 NEWS neighbours will be added at each iteration. This mode is good to have a clean non overlapping view of the graph.*

## Proximity Algorithm

The proximity algorithm will calculate the distance between two participants. If we are interested only by the country, participants that live in the same country will have proximity of 1.0. Participants that live in a different country will have proximity of 0.0. Proximity can be a number between 0.0 and 1.0 to evaluate the strength of the link.

We have defined some matching between the two participants. The end-user can give a weight between 0 and 1 for each of these matching. The relation will return a number between 0 and 1 that represent the similitude between two participants based on the matching. (A country matching will return 1 if both people are from the same country or 0 is both people live in a different country).

$$S(P_1, P_2) = \frac{\sum_{\text{Sur\_toutes\_les\_relations}} \omega_i M_i(P_1, P_2)}{\sum_{\text{Sur\_toutes\_les\_relations}} \omega_i}$$

$P_1$  = Participant 1

$P_2$  = Participant 2

$S(P_1, P_2)$  = Distance between two participants

$\omega_i$  = Weight of this relation (Defined by the end user)

$M_i(P_1, P_2)$  = Calculated similitude between two participants using one matching

We can take the example of a set with two matching. We do a matching base on the name and a matching based on the country. The participant 1 is called Jean-Pierre and lives in Switzerland. The participant 2 is called Pierre and lives in France. The user has defined a weight of 0.8 for the name and 0.2 for the country. The similarity between name "Pierre" and name "Jean-Pierre" will be calculated using the algorithm bellow and is 0.75.

The similarity will be:  $(0.75*0.8+0*0.2) / (0.8+0.2) = 0.6$

The best neighbours are the participants that have the higher similarity related to the parent node.

Note: Similarity is not a reflexive function. You can be the friend of someone, but this person will not be your friend.

### **A system between formal and not formal**

The end-user can give a different weight to the different possible matching. He can personalize the application to view the network that interests him.

The relations can be formal. If we make a relation based on the county, you are from the same country or you are from a different country.

Majority of the data are entered in an informal way. Some participant will enter "public relation director" and some others will enter "marketing director". There is a relation because both are director, but both are not exactly the same. We have decided to return a value between 0.0 (not match) and 1.0 (perfect match) that represent the similarity between the two title.

The current algorithm used for the majority of matching between two sentences works in the following way. [0]

Words are extracted from the sentences. Some too common words like “and”, “the”, “europe” are removed.

Participant 1 => Words : M1[0],... M1[n] => Set of words 1

Participant 2 => Words : M2[0],... M2[m] => Set of words 2

Words that are in the two sets => Set “Match”

Words that are only in one set => Set “Not Match”

The number of letters in set “Match” => m(match)

The number of letters in set “Not Match” => m(not match)

The similitude between the two sentences is calculated by

$$S = m(\text{match}) / [m(\text{match}) + m(\text{notmatch})/2]$$

Example: If we compare “public relation director” and “marketing director”

$$m(\text{match}) = 8$$

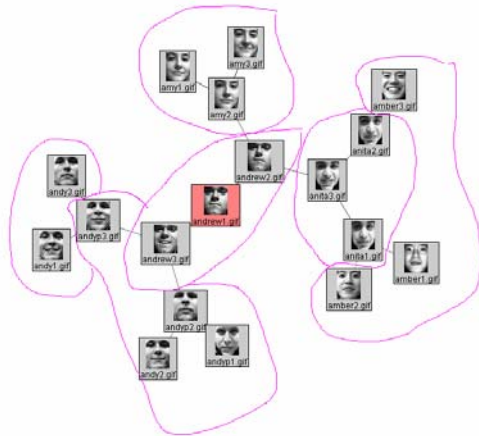
$$m(\text{not match}) = 6 + 8 + 9 = 23$$

$$s = 8 / ( 8 + 23/2 ) = 0.41$$

If we have a longer text, like a CV for example, we can use an algorithm like the LSA (latent semantic analysis) [Many references on internet]

As an example of a non formal matching, I have used an algorithm that gives the similarity between two faces using eigen vector.

This is our results.



We can do some others interesting non formal matching in the future that use the pitch and frequencies of the voice. Based where you live, you have a different accentuation, so it could be interesting to make a matching using this feature.

## 6. Results

The application was not yet released to participant, but will be finished and available to participants at the end of 2004.

We were not able to test it using “real test” participants as we were asked not to disturb them. We cannot give feedback from the “real” users, but only from the staff. This project is also a starting point of a wider networking project.

We have tested it using the IMD staff.

### 6.1 User evaluation

In this paragraph, we will give some feedback by staff, managers and consultants.

How can we evaluate our system? Will participants be interested by using this system? We haven't done any deployment yet, but we will evaluate the program by making statistics. To make these statistics, we will ask participants to answer surveys and asking what they think of the application. We will also make an analysis of the number of time the application was used and the duration of each usage.

We have asked to some person of the staff their impression of the system.

#### **Karsten**

Karsten is a research associate. One of his tasks is analysing surveys. He really likes the idea and the implementation of this project. He uses social networking analysis technologies to analyse and visualise answers of surveys. Surveys are answered by participants and analysed by Karsten. Teachers then display the result to participants. He was very pleased by the interactivity of the application compared to others available software that are too static.

This application could be used in the future to display the results in a more interactive way. We can imagine seeing answer of survey in real time. The teacher displays the graph and then asks participants to answer a survey and the graph move while people are answering.

#### **Claude (serendipity)**

He likes to “play” with the application, he like the way transition is done between the different networks and all participants that fly away and appear. He likes to find participants that live in a specific country, he likes to view links between people. We have seen an interest in finding people he know and to see who the people around are. At the first look, he needs a small presentation of the application to learn what the use of the application is. He is also lost in the multitude of features.

We will write a description on the background of the application that explain what the application do and we will give the possibility to the user to have a “Simple” mode with a minimal number of features in a future release.

He would also be interested in seeing networks by “differences”: To see persons which are not in the same country for example.

### **Group of IT people**

They were interested in looking the face of people on the campus. One of the (miss) usages was looking who the girls on the campus are.

They find this application great and have fun looking at the network of people and seeing the networks that appear and disappear.

One of the proposed usages was to use it in dating events. They think that this application would be great in such a commercial domain.

### **One manager of the staff (strategic)**

He will soon follow a program at IMD and was interested in finding specific people. He like the way to find people that might interest him. He was interested in finding some contacts that are in his field.

He would be interested in seeing the people that will be on the campus when he will do his program. This feature is not available, but this is not really a problem, because participant will use the program when they have started the program. He would be interested to know when people leave the campus to contact them before they leave.

## **6.2 Future**

This is some idea of improvement to our system.

### **Better interactivity**

The system in his current state is too complicate to normal users. One idea to resolve this problem is to give a different granularity of the system based on the “expertise” of the user. If a user is new to the system, we will show him only the basic interactions functions like search and actions. If the user wants a more complete version of the application, he can set his “level of expertise” on the system to a higher level. With a higher level he will be able to see more options and change more features of the application.

It could be nice to differentiate between the two types of managers: strategic and serendipity. These two types of users will not have the same use of the application and will not use the same functions.

### Negatives weights

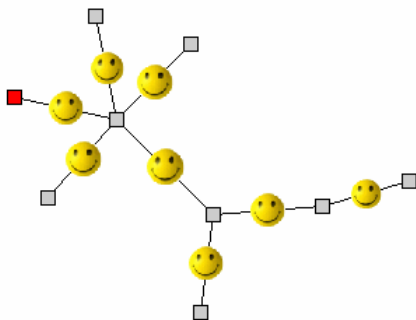
We are building our system using similarity between participants. It could be interesting to find people that are similar on some aspect, but different on others aspects.

We have for example the marital status of the participant: “Married, Single, With Partner” and the sex: “Man, Woman”. It could be interesting to link people that are single with others people that are single but with a different sex.

If we want to develop new companies in many countries but with managers in the same field, it could be interesting to put a negative weight on country and a positive weight on the “area domain” of the participant.

Difference is the best way to share new knowledge, but people must not be too different or they will not understand each others.

### Friend of a Friend



We can ask on the website who knows who. A participant describes others participant he knows. Using this feature, a participant can find how to be introduced to another participant using a third person. This is often the main (and only) available feature in others socials networking software.

A less “formal” way to network people by relations is to use the exchange of mails between participants. If we can track which mail a sent to which participant, we can have an idea of the strength of the relation between two participants.



### **Friend of a Participant**

It could be interesting in the future to link our project to external sources.

We can imagine giving the opportunity to each participant to link his profile to LinkedIn. Using this link we could know the friends of each participant (that are and are not on the campus). Knowing friends that are not on the campus of each participant could be great. A participant on the campus can use another participant on the campus to be introduced to someone that is outside the IMD campus.

It could also be a great way to do some indirect marketing. We advertise IMD using participants that have followed IMD programs.

### **IMD Badge / Recognize participants**

We can imagine in the future modifying the badge of the participant to be recognized by a webcam. If two participants are in front of one of the flat screen, they will be recognized and the relation between them will be displayed on the screen.

This is an idea of a badge using the SpotCode [11] technology.



### **Discussion Introduction**

We could give the possibility to participant to describe what kind of interest they have. Example: "Football, Tennis, Golf, Industries in China".

It would be a good way to "break the ice" by finding shared interest between participants.

We can also imagine having a flat screen (meeting screen) and recognizing people who are in front of this screen. If they share a common interest, this interest is displayed on the screen.

### **Others relations between participants that are less formal**

In the future we can use other relations between participants.

We can imagine tracking the **exchange of mail** between participants and using this feature as a link between participants (This is a way to replace the “friend” feature in a nicer way).

**Image analysis:** We give the possibility to each participant to post images they like. We compare each images based on the colours, the complexity (frequencies), the forms (circles, lines) then they can navigate through participant using the similarity of their images.

**Free text analysis:** Using an algorithm like LSA and Wordnet [14], we can imagine giving the participant the possibility to describe themselves using a free text. We make a link between participants using the distance between the two texts.

**Voice and Tone analysis:** We analyse the pitch and the tone of the voice of the participant (We make a Fourier transform) and we calculate the distance between the two voices. We will get implicitly a distance between participants that will be similar to the way they speak, so more or less the region they come from or their original language.

### **6.3 Other sets of Data**

This application has been developed so we can use others set of data in a very easy way. We can use another network after having extended some classes.

#### **Show how can we do it (for programmers)?**

If you want to create a new dataset, you first have to extend ParticipantSet. ParticipantSet represent the list of participant or the list of objects.

You must extend a Participant. A participant is information about the participant like his name, a picture and some others attributes.

You must create some possible relation between participants. You have to extend the MatchingGenericProcessor class. This class will represent the distance between two participants using one of the attribute of the participant.

You can create some actions that can be done on the participant by extending the ParticipantAction class.

You link all objects in the Main class.

## Survey Analysis

Surveys are used in many courses on IMD. The application can be used to analyse these surveys and navigate through the results. Some research associate seems to be interested in using the application to replace some of their social analysis software.

We have made another set that display the results of some OWP 2004 surveys.



## Dating websites

You can imagine using this application on dating websites and event. It could be a cool way to do some speed dating nights. (You have 7 minutes to meet someone and you meet 7 persons.).

## Navigate through the programs of IMD

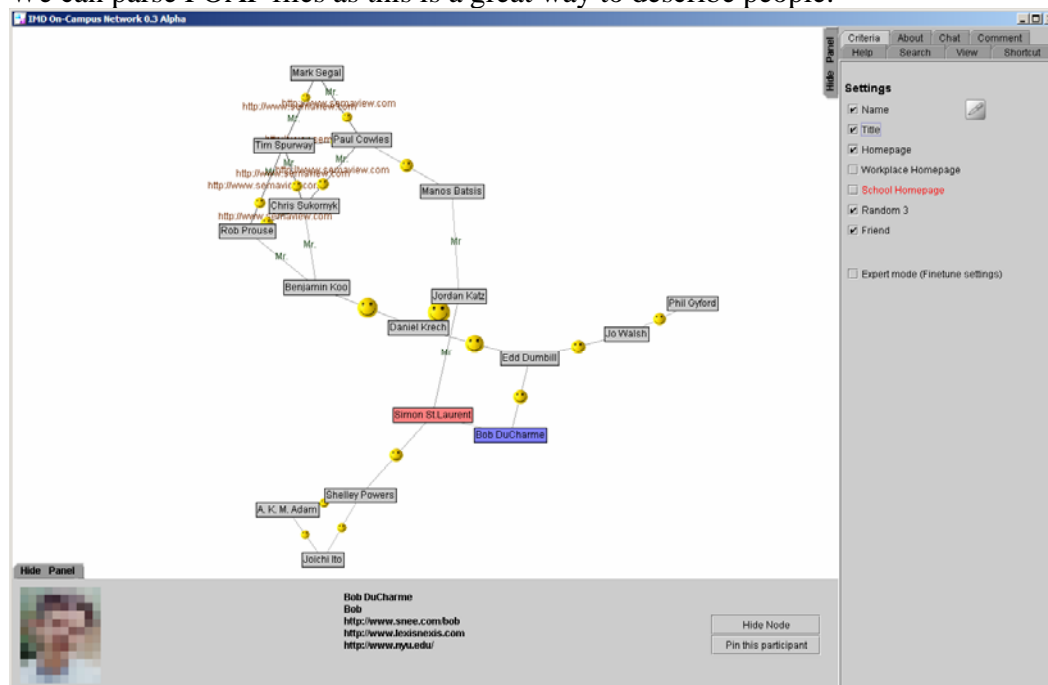
We can imagine navigation through the programs of IMD using this application and a “programs set”. A “Participant” will become a program, and the link between programs will be teachers, audience, dates, place of the program and others links.

We can put this application as an applet on the IMD website.

## Navigation using FOAF files

The *Friend of a Friend* (FOAF) project is about creating a Web of machine-readable homepages describing people, the links between them and the things they create and do.

We can parse FOAF files as this is a great way to describe people.



It is interesting to see the semaview group [www.semaview.com](http://www.semaview.com).

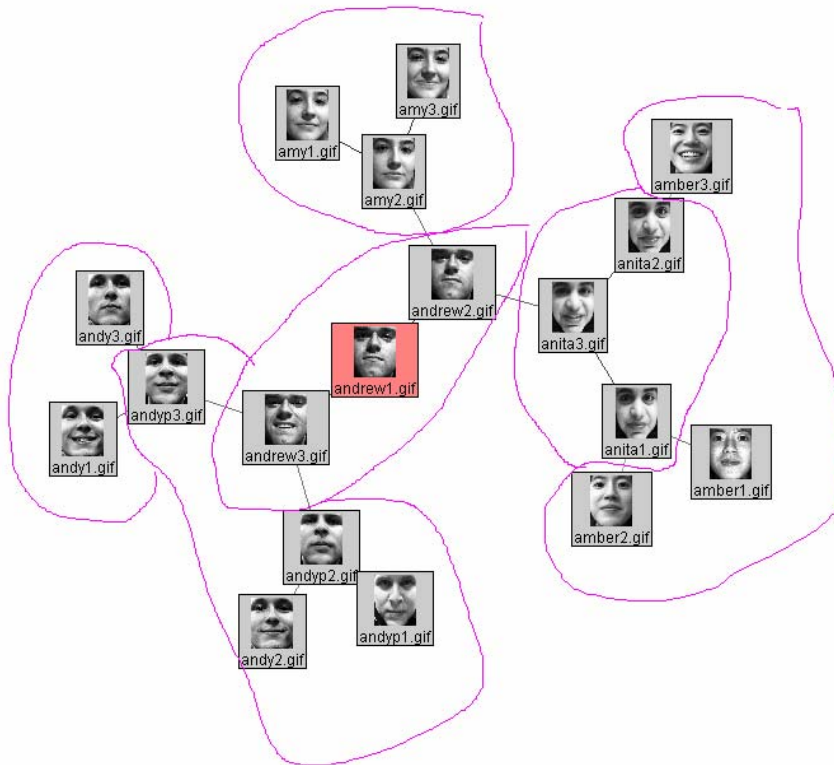
This is an example of a short XML Foaf file

```
<foaf:Person>
  <foaf:name>Dan Brickley</foaf:name>

  <foaf:mbox_sha1sum>241021fb0e6289f92815fc210f9e9137262c252e</foaf:mbox_
  sha1sum>
  <foaf:homepage rdf:resource="http://rdfweb.org/people/danbri/" />
  <foaf:img
  rdf:resource="http://rdfweb.org/people/danbri/mugshot/danbri-
  small.jpeg" />
</foaf:Person>
```

## Face recognition

We have developed a set that use a simple algorithm (using eigen vector) to calculate the distance between two faces. You can navigate between faces that look similar using this set of data.



## 7. Conclusion

We have extracted the following hypothesis in the objectives

- How can we help the strategic managers?
- How can we help the serendipity managers?
- How can we speed up the process of accommodation? The time needed by managers to feel at ease.
- How can we advertise IMD as a “global meeting place”?
- A software that is more natural, that look less formal than current systems

Have we given a solution to these objectives?

### **How does it help the strategic managers?**

We can help the strategic managers with the “search” function. Participants will be able to find people that interest them. They will also see people that not really match but are similar to current participants.

They will perhaps be disappointed by the informal (and unusual) way of searching. You don't give a specific result with this system, but an informal result.

They can keep a list of contact information and send contact invitation to some interesting participants using the “action” buttons.

The informal and unusual way of searching can be disturbing to new users, and the graphical interface is too complicate. It will be simplified in the future.

### **How does it help the serendipity managers?**

Users will see the network of participants that are currently on the campus. They will probably begin to use the application as a kind of “game”, but as they will see others people, they will be interested in networking with some clusters of participants.

The chat (not yet implemented) is here to break the ice between users of the application. If you chat with someone you like, you will be interested by a face to face interaction.

### **How do we speed up the process of accommodation? The time needed by managers to feel at ease.**

This application will show clusters of participant that are similar in one or more domains. These clusters will be more or less being represented in the reality. People tend to be clustered in groups of same country, same language, same program or same company. The network created on the application can show an existing network. By the use of the application, participant will see faces and associate group of faces to groups of participants. Their environment of unknown faces will become an environment of known people so they will feel more comfortable and be more in a mood of networking.

**How do we advertise IMD as a “global meeting place”?**

We have given a tool to participants that can be used to find people on the campus. Users of the application will see that they are more than the about 40 participants who are following the same course. We give the feeling of a large community by showing the large set of people that are on the campus

Making an application dedicated to find people is also a way to show to participants that they are here to find new contacts.

**How is our system more natural, that look less formal than current systems**

Our system is more natural than others systems, because it builds networks that are more similar to real networks. The user can display the network he is interested in by customizing the weight of relation between participants. We have two types of relations: formal and not formal. Informal relations will give a number that represent a comparison between two participants. In the future, we are interested in using informal information like the tone of your voice or the website you visit.

Based on the tests on the staff, this application responds to the participants need and they will be stimulated to develop their social network as they are more aware of the social networking environment of IMD.

We have created a system that will be a basis to many other projects. We can give the example of the analysis of surveys made by participants. By seeing the interest of the members of the staff, the large number of situations this project can be used and the endless ideas of many people, this application is the starting block of a new concept of social networking software. People like this new concept of navigation and are imagining endless potentials development of this project.

We can rate this project as a successful base, but some refinements must be done before being able to put it in production.

## 8. References

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- [5]: Diane Darling, *The Networking Survival Guide* (McGraw-Hill)
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- [8.1]: Andree Shleifer and Lawrence Summers, "Breach of Trust in Hostile Takeovers"
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- [13]: TouchGraph, *A dynamic graph layout component in Java.* (<http://www.touchgraph.com/>)
- [14]: Wordnet, *WordNet is a free semantic lexicon for the English language* (<http://www.cogsci.princeton.edu/~wn/>)
- [15]: FOAF, *The Friend of a Friend (FOAF) project is about creating a Web of machine-readable homepages describing people, the links between them and the things they create and do.* (<http://www.foaf-project.org/>)