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FINAL THESIS REPORT

**Developing an Emergency Response Logistics
Programme for Tampere University of Applied Sciences**

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ABSTRACT

The background of this thesis dates back to March 2008, when the original topic *Emergency Response Logistics and Hospital Logistics* was given at the Tampere University of Applied Sciences as an extra-curricular report to fund a logistics study trip to Slovenia. After brainstorming the topic and structure of the report, it came apparent that the topic would be suitable for a final thesis, as the nature of the development project changed; the name was also changed into *Emergency Response Logistics*. This thesis is carried out for Tampere University of Applied Sciences and more precisely for Dr. Anasse Bouhlal.

The purpose of the project was (1) to find out whether or not it would be plausible to start a new educational module within the Degree Programme in International Business at Tampere University of Applied Sciences. (2) To build a network of partners that would be willing to help with the designing of the module and provide support for example in the form of consultation, guest lecturers and example cases. (3) To contemplate on what emergency response logistics is, and also (4) to find out what sort of thoughts this topic and module caused in selected key individuals globally. Not forgetting the purpose of generating dialogue between different parties.

The theoretical framework includes basic theories and ideologies in supply chain management, while keeping the emergency response logistics point-of-view in mind. The framework of the thesis covers short introductions of the parties seen, referring to the building of the network.

Working methods included physical meetings with chosen parties to build the network. Also an international MSc and MBA programmes of Coventry University, England were benchmarked. As a quantitative research method the project included a short questionnaire sent to key individuals to survey their interest in the educational module. Nine persons in total responded to the survey.

The key findings were that it would actually be plausible to commence a new study module in Emergency Response Logistics, and it could indeed be carried out together through one or more partners. It also came apparent that the key individuals who received the questionnaire were quite interested in the educational module.

As a result of this project a new Disaster and Emergency Supply Chain Module has begun at Tampere University of Applied Science, this module is commenced jointly with the Tampere University of Technology. For the time being the module consist of three different courses, adding up to a total of ten ECTS. When thinking of the future and this project, a Disaster Management MBA programme could be designed and implemented on the basis of this thesis.

Key words: Emergency Logistics Supply Chain Management Development Project
Humanitarian Supply Chain Management Relief Chain Network

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1. INTRODUCTION

With the emergence of ever more serious natural disasters, civil emergencies, wars and terrorism, Emergency Response Logistics has become a crucial part of the world today. With the logistical challenges these international crises bring forth, I became ever more interested in Emergency Response Logistics and Disaster Management. I have also had concrete training in humanitarian aid and crisis management, when I served one year in the Finnish army, Pori Brigade, Finnish Rapid Deployment Force (these troops have previously served for example in Kosovo, Bosnia, Eritrea, Tshad and Afghanistan.) I served in the field of reconnaissance and advanced to the rank of a sergeant.

In brainstorming with Dr. Bouhlal the initial topic was transformed from *Emergency Response Logistics and Hospital Logistics* to *Emergency Response Logistics*, which was further approved by Mr. Janne Hopeela, Head of the International Business degree at TAMK, as a subject for bachelor's thesis.

During my international exchange period, I studied in The Netherlands, Amsterdam. I attended two courses that gave me insight and perspective to Emergency Response Logistics. These courses were *Demand Chain Management* and *International Trade*, the latter being closely related to the management of risks.

The original topic *Emergency Response Logistics and Hospital Logistics* was given by Dr. Anasse Bouhlal, the director of Mediterranean Institute (MEDA-Institute) of the Tampere University of Applied Sciences (Appendix 1). However, it was narrowed down to *Emergency Response Logistics* since the topic is new and not a lot of previous research was available.

The objectives for this thesis were to find out if it would be plausible to organize a new educational programme concerning emergency response logistics in the Tampere University of Applied Sciences. If found plausible, the thesis should look to tie different parties into a network, which would enable further action to be taken in the future regarding the matter; ultimately in the long-run put together an MBA programme of

Emergency Response Logistics offered by TAMK. This kind of educational programme addressing generally interesting and relevant field would also benefit the Tampere region and partners in the network by giving them significant visibility.

The reason for providing such education in the degree programme in International Business is that Emergency Response Logistics has become an ever more important issue. The programme would also ensure the evolvement of competitive education offered by TAMK. Offering this sort of education will also give TAMK and the International Business degree national and international awareness.

2. BACKGROUND OF THE PROJECT

This project began as an extra, non-mandatory task for the course Transportation Management. This extra-curricular report funded a logistics trip to Slovenia, France and Italy. By accepting the task, I received a grant to fund the study trip, during the trip I learnt more of sea and air transportation which gave more knowledge base to work with. The discussion also led to a new angle to the thesis: could TAMK begin to offer Emergency Response Logistics in the international business studies?

The TAMK International Business degree syllabus structure consists of different levels of studies. During the first year degree students complete their *basic studies* (60 ECTS). After the first year students continue with specialization studies called *professional studies* (90 ECTS). In the course of the two first years, students will also need to complete *free-choice studies* (15 ECTS). During the remaining time (after the two years) students are required to complete their *practical training* (30 ECTS), and their *final thesis* (15 ECTS).

The educational programme would consist of a few smaller courses relating to disaster management, which would build to form a larger compilation. After implementing this smaller scale programme, further work and research could be taken towards forming a Masters level degree programme of the subject. Ultimately both local and global partners would help design the master's programme, which would mainly be pointed towards foreign individuals. It would be crucial for this programme that foreign and domestic partners would take part in it, thus making the need for a vast comprehensive network. The courses derived from this final thesis relating to Emergency Response Logistics will become part of the professional studies offered to both degree students and exchange students. The teaching of emergency response logistics is mainly targeted to the second year students who show interest in Logistics and Supply Chain Management.

The reason for offering teaching as a network was simple, better expertise could be offered if representatives from different fields could somehow contribute to the teaching.

Also if co-operation between schools was to happen, students would benefit even more as they could participate in studies offered by another school. This was particularly interesting as no such teaching is really commenced in Finland, or not at least in the manner thought of in this thesis.

Additional aim of the thesis was to improve the logistics teaching in TAMK. Emergency response logistics is important due to the reason that as companies tend to shift production sites and warehouses outside of their home countries, their supply chains become prone to different emergencies and crisis. The education is designed to give the students participating in it a real competitive advantage and important insight on the risks a supply chain may face. The courses would give students know-how on how to assess risks related to managing supply chains (both internal and external), how to build a durable supply chain, mitigate or not to mitigate risks, proactive vs. reactive supply chain management etc. Those are some of the theories related to emergency response logistics and will be described later on in more detail.

The main objectives of the thesis are to answer:

- Would it be plausible to organize teaching of the subject at TAMK?
- Could the teaching be carried out in co-operation with a network of partners?
- What is Emergency Response Logistics and what could the contents of teaching module include?
- Who would comprise this network?

3. OBJECTIVES OF THE PROJECT

The objectives of the project were divided to two different scopes, short-term goals and long-term goals. One could say that the short-term goals and objectives played a more important role in the thesis, as the short-term goals make up the body of the thesis. Long-term goals were more to do with what the thesis has made possible (with someone else having to continue where this particular thesis ended). The ultimate goal would be to build an extensive network, ideal for evolving emergency response logistics.

The short-term objective of this project was to further exhaust the concept of emergency response logistics. Try to come up with some kind of a concept that could build a base for collaboration between different bodies to provide better logistics education to students and to provide a totally new concept of teaching for students to attend. Objectives were also to research who the possible partners could be, how to contact them and forming the blueprints for the network. To research if such studies would be plausible to offer and by defining the subject more, what could the courses consist of. The goal is to put together a platter of three courses (worth 10 ECTS) together. One short-term goal is to bring the different partners to the same table to discuss the topic and prepare grounds for the long-term objectives to be met.

Longer-term objectives, which are hoped to result as of this project, are basically similar to the short-term objectives, except on a much larger scale. The long-term goals are to form a network not only with local partners, but introduce international partners to the programme from the EU, Asia, Africa and Latin America, possibly even build relations to India and Japan.

The idea behind the long-term goal is to form an MBA level programme of the subject emergency response logistics with the help of partners acquired from around the world. The programme would give TAMK important visibility as the MBA programme would be commenced in English and foreign professionals invited to join the alumni of the programme.

Another long-term goal is to build research and development operations to run along side with the MBA programme. Again the optimal situation would be that participants from multiple countries could take part in the R&D processes on some level. After getting the R&D branch of emergency response logistics ready, the next objective could be strived for. This would be the designing and implementing of a forecast model. In short, worst case scenarios could be input into the model to give a forecast of what a certain kind of disturbance would cause to a supply chain. In a way to test what a fire at a warehouse would cause to the supply of material A, all this would be done in a virtual environment, where no real damage could be inflicted.

The third long-term objective would be to bring in more influential partners to the network to work with the educational and research & development programmes. These partners could for example be the Global Red Cross, the European Union, United Nations and for example some military branches.

4. PARTNERS AND STAKEHOLDERS OF THE PROJECT

Partners in this project consisted of five organizations. The main partner in putting together the educational programme of emergency response logistics was the Tampere University of Technology. Other organizations that were visited and the concept of the thesis presented to include: the Red Cross of Finland, TeliaSonera from the business world, the National Emergency Supply Agency and multiple experts from the business world and of course the Tampere University of Applied Sciences.

The partners were chosen due to already known contacts with in the parties, and due to discussions with the first partners. One could say that a chain of events lead to choosing these partners. Firstly Dr. Bouhlal provided a name of a contact at the Tampere University of Technology, who was then contacted and introduced to the concept behind the thesis. At the end of the discussions recommended to contact the National Emergency Supply Agency, as it happened, I learnt that I already had a contact there so the meeting was set. During the discussion at the National Emergency Supply Agency the importance of critical IT infrastructures arose, hence the reason why TeliaSonera was contacted to hopefully provide consulting relating to the matter. Lastly the Red Cross of Finland was contacted due to the expertise and experience they have in crisis related logistics.

Ultimately all partners were such that suited best for the long-term outcome of the final thesis, this is also the reason why they were contacted and introduced to the thesis subject. All parties seemed to be keen on the matter and interested in it.

4.1 Tampere University of Technology (TUT)

Tampere University of Technology is an important resource of expertise as a partner to the whole subject. The University of Technology can bring forth a more technical approach to the subject of emergency response logistics. Combining the theories and concept from the commercial side with the more scientific concepts will benefit the students and give them a chance to build a broader, solid base for learning.

The Tampere University of Technology offers students education in different technical subjects and also architecture. Students who are accepted in and eventually graduate will acquire Masters level degree of Science in Technology or Architecture. Currently there are about 12 000 students studying at TUT, with students completing both undergraduate degrees and postgraduate degrees. TUT also has research activities and currently provide employment to 1 900 people. Over 80 percent of the personnel are employed in teaching or research activities.

Department of Business Information Management

When thinking of the network for the emergency response logistics teaching, the interest in TUT arose, and more precisely interest towards their Department of Business Information Management and Logistics, which is a part of the Faculty of Business and Technology Management. While TAMK can provide a more business oriented approach to emergency response logistics, TUT and the department of business information management and logistics can offer a more technical approach to the teaching of the subject. Also the theories and concepts present in both approaches (technical vs. business) differ in some extent, but when both approaches are kept in mind, the teaching, students receive will be more comprehensive than only using the tools provided by one approach. The contact person at TUT was Mr. Jorma Mäntynen who is a professor at the Department of Business Information Management and Logistics.

The fields of research and education at the Department of Business Information Management and Logistics are:

- Business information management
- Software business
- Information economics
- Information security management
- Entertainment and media production management (EMMi Lab.)
- Transportation systems
- Logistics and supply chain management
- Futures studies.

4.2 Red Cross of Finland

The Finnish Red Cross is one of the largest civic organizations in Finland and has approximately 90 000 members, but also numerous volunteers and donors. In Finland the Red Cross has activities in 12 districts and 550 local branches.

The Red Cross of Finland was chosen for their immense amount of experience in the field of civil emergencies and humanitarian aid. They can provide important information on matters related to humanitarian aid, and also the preparations and logistics solutions related to them. It would also benefit the programme in another way; if they would be a part of this programme the whole concept would receive a base for a strong brand as the Red Cross is associated so strongly with good things.

Reasons for involving the Red Cross of Finland with the thesis, and more precisely with the education of emergency response logistics, became apparent when thinking of logistics. For what organization has better understanding and experience in transporting equipment, people, food, goods etc. over long distances where mobilization has to happen swiftly and with a short response time. The Red Cross could provide first hand information on managing long supply chains where articles of all sorts are transported over distances, and sometimes harsh conditions. Getting the Red Cross of Finland to be part of the study programme as a sponsor for example, would give an important marketing advantage to the education programme. The contact person at the Red Cross of Finland, Tampere region was Mr. Pertti Rantanen who works as a Logistics Coordinator at the Tampere branch.

4.3 TeliaSonera

TeliaSonera is a large organization that provides telecommunication services in the Nordic and Baltic regions, but also in the growing markets of Eurasia, including Russia, Turkey and Spain. TeliaSonera employs about 32 170 people. To give an image of the size of the company the net sales of TeliaSonera reached an impressive 10, 2 MEUR. TeliaSonera has about 43.4 millions of subscriptions and on top of that 91, 4 million more deriving from associated companies.

TeliaSonera is a private telecommunication firm that can provide important insight on security matters related to the protection of critical infrastructure and measures against cyber-terrorism. TeliaSonera can also provide consultation related to securing for example a company Enterprise Resource Planning system against external, but also internal threats. Getting a big private company from the commercial life would benefit the education, as they can provide important real-life cases to the alumni.

As TeliaSonera works in the field of telecommunication, it would be a strong addition to the network. One may ask how they relate to emergency response logistics. The answer is quite simple, as the educational programme would benefit of their expertise in critical data-infrastructure protection and knowledge of databases and threats different operating systems might face. For example if a company's core, various information systems, would be attacked by e-terrorist, how can the company prevent this from happening, and if it happens how can the company quickly respond to the crisis; thus achieving business continuity. The modern supply chains and transportation with in the chain highly rely on technology these days, thus a crisis or disaster threatening the global supply chains can also be in the virtual world. The contact person at TeliaSonera was Mr. Jarmo Koski, who was head of information technology (IT) security at TeliaSonera.

4.4 National Emergency Supply Agency (NESA)

The National Emergency Supply Agency (NESA) is an agency working directly under the support of the Ministry of Employment and the Economy. NESA is responsible for planning and operating to maintain levels of supply, most importantly to secure supply with in the country. The emergency supply safety-net is designed to insure supply of goods and materials in times of emergency situations or serious disturbances to normal life. The National Emergency Supply Agency has experience and important knowledge on the whole issue of emergency response logistics and is an important party to have involved as they are affiliated with the Finnish government. They also design contingency plans relating to the national supply of goods and materials during emer-

gencies or seriously disruptive times. Lately NESAs has shifted its focus more towards the securing of critical IT-infrastructures, such as databases and operating systems; this is to secure the continuity of operations if something goes wrong, whether it be a crisis manmade or by nature.

The tasks that NESAs needs to secure during an emergency include for example to uphold economic activities necessary to the population's livelihood, the national economy, and national defense during emergency. An ever increasing focus point of NESAs has been different information systems and also the concern of securing the functioning of critical technical systems in disruptive situations. NESAs also does planning on the matter of business continuity, which is a topic often discussed when concerning emergency response logistics. Bringing NESAs into the education network offers TAMK an important contact, that has both intellectual know-how to offer, but also (like the Red Cross of Finland) political capital to the educational programme. The contact person at NESAs was Mrs. Raija Viljanen, who works as a special advisor in the department of logistics.

5. TARGET GROUPS AND BENEFICIARIES OF THE PROJECT

Target groups of this project are of course the students participating in the education, but also TAMK and other parties involved who enable for the education to be commenced in such a manner; with the main target group being TAMK and students studying logistics at TAMK. TAMK would benefit from the programme with the possibility to attract more students, as the studies offered would increase and become more versatile. Most likely such a programme would also get media coverage to some extent, thus increasing TAMKs' presence locally and globally. Students of TAMK would also benefit from the programme as more options would be presented to them in the courses they have to choose. This type of unique education would also set them apart from the mass of graduates, and give them a competitive advantage when searching for jobs in the fields of logistics.

The Emergency Response Logistics –programme would entail studying commercial logistics and its applications in civil crisis management and how current methods could be developed, how humanitarian logistics operations function etc. The programme would give the students a good base to build know-how later on in working life.

Beneficiaries of the project are TAMK, students, organizations involved with the designing of the educational programme and who are a part of the whole process, Tampere region and ultimately one could state that even Finland, as a country, would benefit from such a programme.

Organizations involved will most likely also receive media coverage, thus giving them a chance to uplift their social status. Being involved in educating the future workforce of your home country is never frowned upon. Parties involved would also have the chance to tie connections with the students early on, which could evolve into a longer-term employment relationship.

Tampere region and Finland would most definitely be beneficiaries as the programme could eventually become an MBA programme. In the future this would give positive advertisement of Tampere and Finland internationally. This is mainly due to the fact that this sort of education does not exist with a similar concept in the Nordic countries. Students attending or applying for the programme will also include international students giving Tampere and Finland more visibility. The introduction of such a programme would also endorse the future Tampere – Pirkkala logistics centre.

6. THEORETICAL FOUNDATION FOR EMERGENCY RESPONSE LOGISTICS

Emergency response logistics means an area of logistics that is related to crisis conditions, humanitarian aid and civil emergencies. Logistics in this case would mean the securing of assets regarded as critical infrastructure, supply chains of companies, information infrastructure and integrity, coordinating humanitarian relief logistics and developing, maintaining and updating contingency plans for e.g. commercial companies.

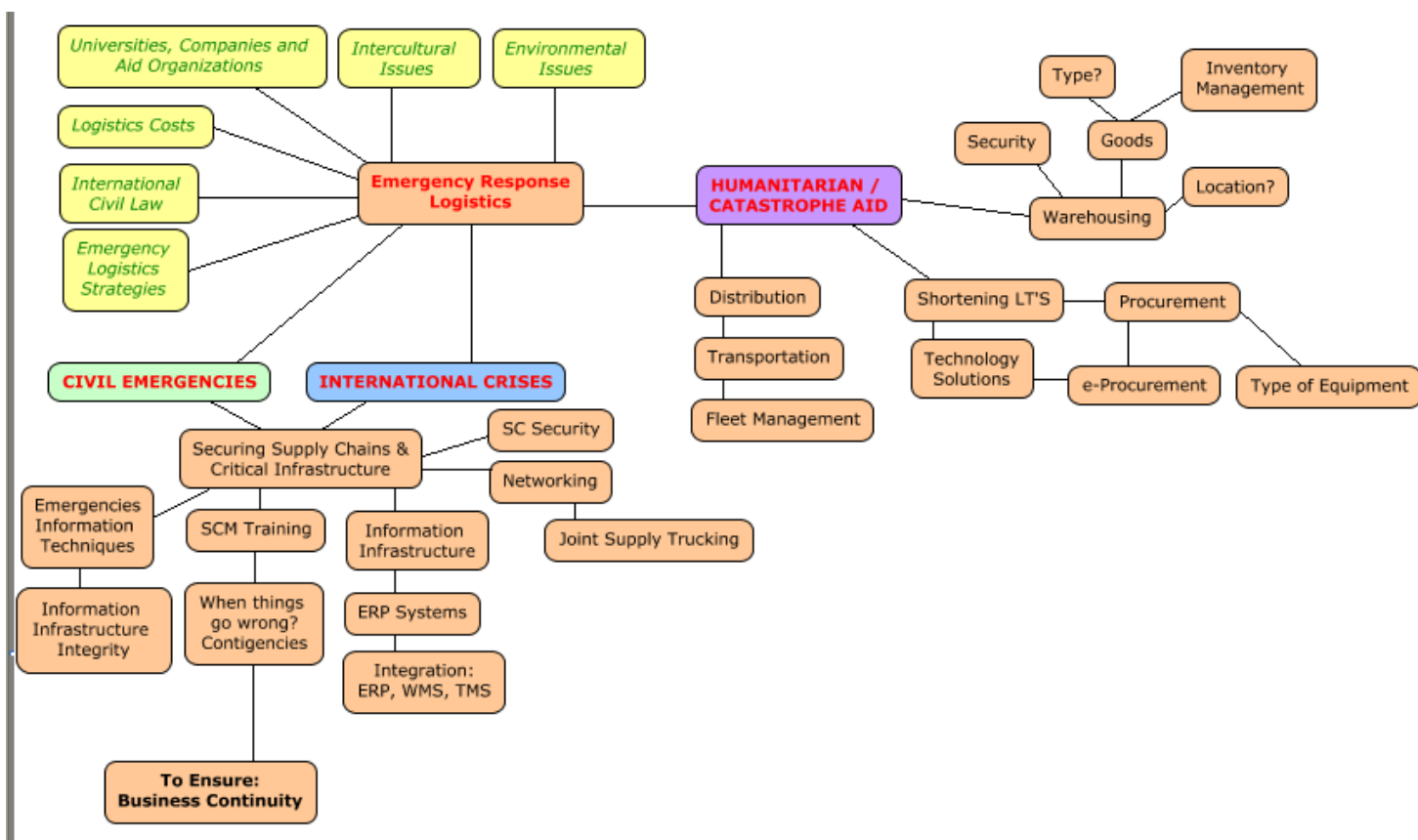


Figure 1. Emergency Response Logistics process diagram (Noppari, 2009).

Figure 1 illustrates the complexity of emergency response logistics; please note that the issues brought to light here are key issues, which I thought were important to this thesis.

Civil Emergencies

Civil emergencies may occur anywhere in the world and vary from being minor emergencies to being devastating in scale. A civil emergency concerns a society or a nation, depending on the scale of the emergency. A civil emergency situation may be either a natural disaster or a man-made disaster. A massive power blackout is an example of a civil emergency affecting a society. Also a terrorist attack can be considered to be a civil emergency (World Trade Centers 2001), but a civil emergency can also be caused by an earthquake, tsunami or hurricane. (Toigo, 2003: 402.)

International Crises

International crises are usually disruptive events that concern more than one nation. The crises itself can be situated in one area of the world, but involves several different nations. For example the shortage of food in third world countries is an international crisis that is trying to be solved with the help of different nations, organizations and individuals. International Crises can also be a larger scale natural disaster, where individuals from different nations struggle to help the effected area and people (Sichuan Earthquake, China 2008). International crises can also be financial relating to the business world, a recent example of this would be the global recession of 2009, where many individuals have lost their jobs and businesses gone bankrupt. (Benson & Clay 2004.)

Humanitarian / Catastrophe Aid

Humanitarian and catastrophe aid is mainly concerned when a natural disaster happens and the area effected is in need of aid from abroad, for example a tsunami (Thailand, 2004). Catastrophe aid provided by several different national and international organizations (Red Cross, World Food Programme, Military etc.) is usually a crucial part of recovery for the nation / society affected.

Humanitarian aid is usually given to the areas affected by catastrophes, international crises or civil emergencies. This aid is usually in the form of material or logistical as-

sistance provided for humanitarian purposes. The main purpose of humanitarian aid is to save lives, alleviate suffering and make sure that individuals have the facilities to live in humane conditions. (Benson & Clay 2004.)

6.1 Commercial Supply Chain Management

Supply chain management at its simplest form is the management of decisions and processes that ultimately result in A getting to B. However, in the globalizing world of today supply chain management is a lot more complex, demanding and in need of ever more careful planning. One could say that supply chain management these days is not only about acquiring goods and services at the best possible price, but it is also about identifying possible disruptions and risks the supply chain faces, after which measures can be taken to mitigate them. As companies are shifting production to further and further in search of costs savings; the risks of something going wrong during this whole process of A getting to B increase substantially. More time and planning is being put into figuring out of how one can manage the risks related to the supply chain, both external and internal. (Christopher, 2005.)

Supply chain management is also overseeing the transfer of materials, goods, information and finances as the different particles move from supplier to manufacturer to wholesaler to retailer to consumer. Supply chain management greatly involves the coordination and integration of these given processes. Coordination and integration should happen in the internal environment of the company but also correspond accordingly with the external environment the company is in contact with. It is said that the ultimate goal of an effective supply chain management system is to reduce inventory (with the assumption that products are available when needed).

The importance of understanding the supply chain and the risks it faces has also grown to be of more importance due to the fact that a working supply chain is a crucial part for competing with rival firms. The careful designing of the supply chain can very well lead a company to be a market leader.

Below is an example supply chain of the past where mainly raw materials arrive to production from across borders. Production and distribution is being handled within the home country of the organization and the end users are located in that country as well. Figure 2a shows a simplified supply chain where production and distribution is being handled within one country.

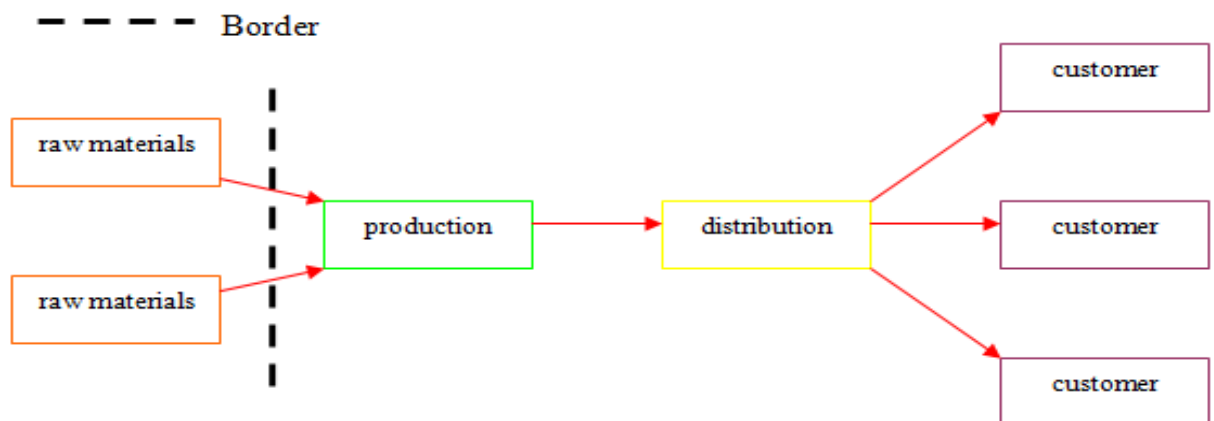


Figure 2a. Simplified example supply chain (Noppari 2009)

As previously mentioned the world is getting smaller. This means that as the economy is continuing its globalization, companies have started to establish their global presence on a much larger scale. Global supply chains are now a reality for a plethora of companies and due to that they have to deal with the vulnerability of their operations. As the number of suppliers, manufacturers, distributors and global customers is increasing in a supply chain this ultimately has an accruing effect on the number of risks the supply chain faces.

On the next page Figure 2b is an example supply chain that illustrates the complexity of the supply chains being designed in the global world, these supply chains can be even more complex, this is just a simplified version that can be compared to the previously demonstrated chain in Figure 2a.

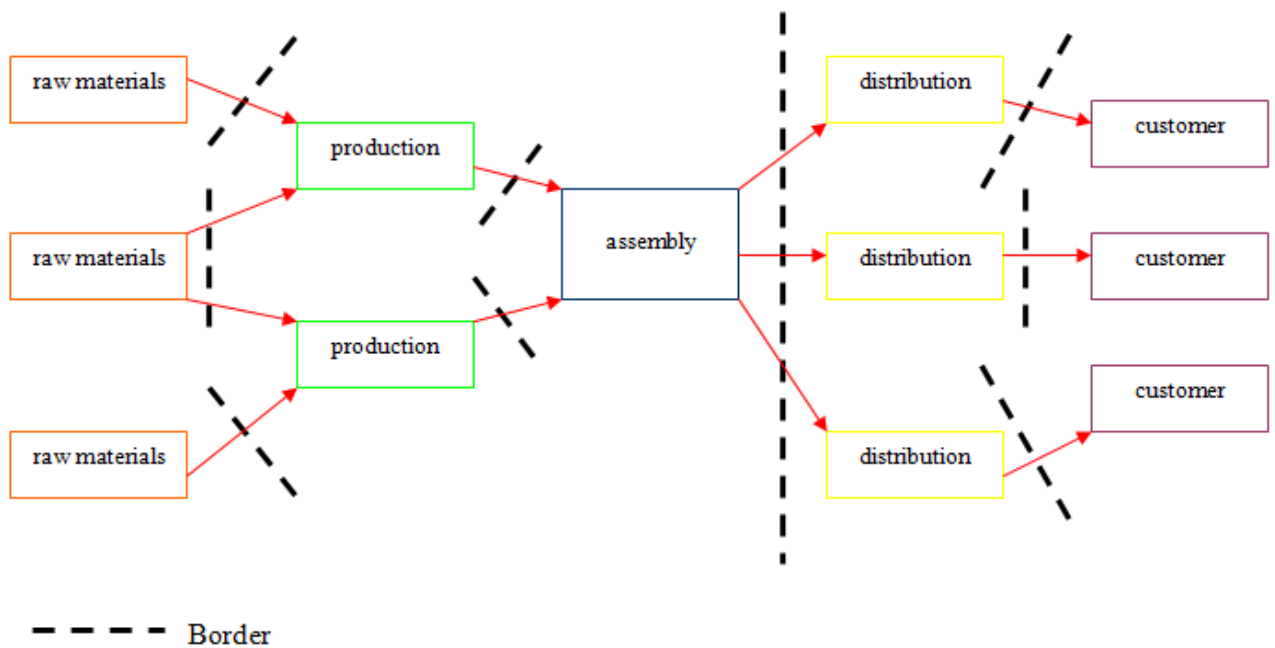


Figure 2b. A more complex example supply chain with the process crossing country borders (Noppari 2009)

6.1.2 Importance of the supply chain

Supply chains can be regarded to be means of creating competitive advantage over competition. One could say that the supply chain is the heart and veins of a company; it makes sure that there is inbound flow of goods, that the process within works efficiently and the outbound flow of components, finished goods or such is sufficient; it is the supply chain that keeps the firm operating.

Supply chain management these days has also become more customer oriented, thus making the punctuality of a supply chain more important. As a matter of fact an ever increasing trend in the world of logistics is to talk about a theory called demand chain management. Demand chain management illustrates the importance of customer oriented approach to managing the processes related to supply. The demand chain is basically the same as the supply chain, with the main difference being that the demand chain is just a supply chain turned up-side-down. This theory suggests that instead of a pushing motion, where products are supplied for customer purchase, they should be produced on demand only, thus promoting a more just-in-time (JIT) atmosphere where

lead times need to be decreased to increase customer satisfaction. Figure 3 helps to illustrate the different hierarchical views between a supply chain and a demand chain.

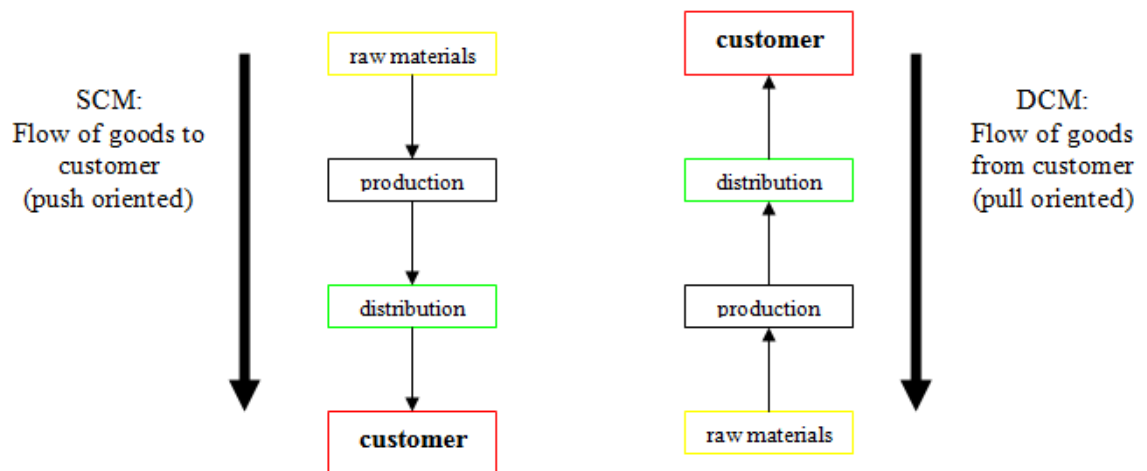


Figure 3. Example of a demand chain vs. supply chain (Noppari 2009)

6.1.3 Robust Supply Chain

A supply chain should always be reliable the even during a disruption the supply chain should be able to hold its integrity. A supply chain should, thus be robust. In the theory of the robust supply chain the supply chain is prone to two different variables, design factors and noise factors. Design factors are controllable, for example the decisions made by management that have a direct or indirect effect on a process. Noise factors, however, are mainly uncontrollable they are variables that represent the field sources of variation, for example weather, natural disasters etc.

Supply chain robustness can best be achieved through the effective implementation of strategic supply chain designing. To achieve a robust supply chain, the management and employees of a company have to consider issues such as: what is the most cost-effective location of facilities (including plants, vendors, distribution centers etc.), flow of goods, services, information flow and funds through out the supply chain (data integration, enterprise resource planning systems, warehouse management systems, transportation management systems etc.), and assigning customers to the distribution centers. (Risen, 2009: 44-46.)

6.1.4 Supply Chain Risks

The risks a supply chain faces are caused by external or internal forces. Risks that may occur can be from either environment or even both simultaneously. What is important to remember, is that external risks can be caused by events upstream and downstream in the supply chain and that might be out of the company's control. The risks from the external events may impact one or several of the following sectors of a supply chain: demand, supply, environment, business and physical risks.

Demand risks relate to unexpected changes or misunderstood orders from customers or end-customers. Risks in the supply have to do with disturbances or sudden fluctuation in supply, or in the flow of goods with-in the supply chain. Environmental risks concern risks that are caused by shocks or disruptive events outside of the supply chain, for example: earthquakes, tsunamis, land-slides etc. Business risks to the supply chain can be for example such factors as suppliers' financial or management stability. Finally physical risks relate to the state in which a supplier's actual physical facilities and infrastructure is in, for example poor conditions in a warehouse can cause non-error free patches or other damages to the goods with in the supply chain. (Sheffi, 2005: 107-110.)

Internal risks are risks coming from with in the company itself, therefore internal risks are such risks that a company can influence and try to control. Internal risks may come from manufacturing, business, planning and control, or mitigation and contingency.

Manufacturing risks are caused by disruptive events in the internal operations processes; one could be the sudden brake-down of a machine. Business related risks are normal business life events such as, changes in key personnel or management, changes in reporting structure of the company and changes in the business processes. Risks related to planning and control is caused by insufficient levels of assessment and planning, but also due to imprudent management. Mitigation and contingency risks are caused by the company not putting together sufficient contingency plans to tackle sudden disruptions in the supply chain. Figure 4 illustrates the external and internal risks and where they might occur. (Sheffi, 2005: 107-110.)

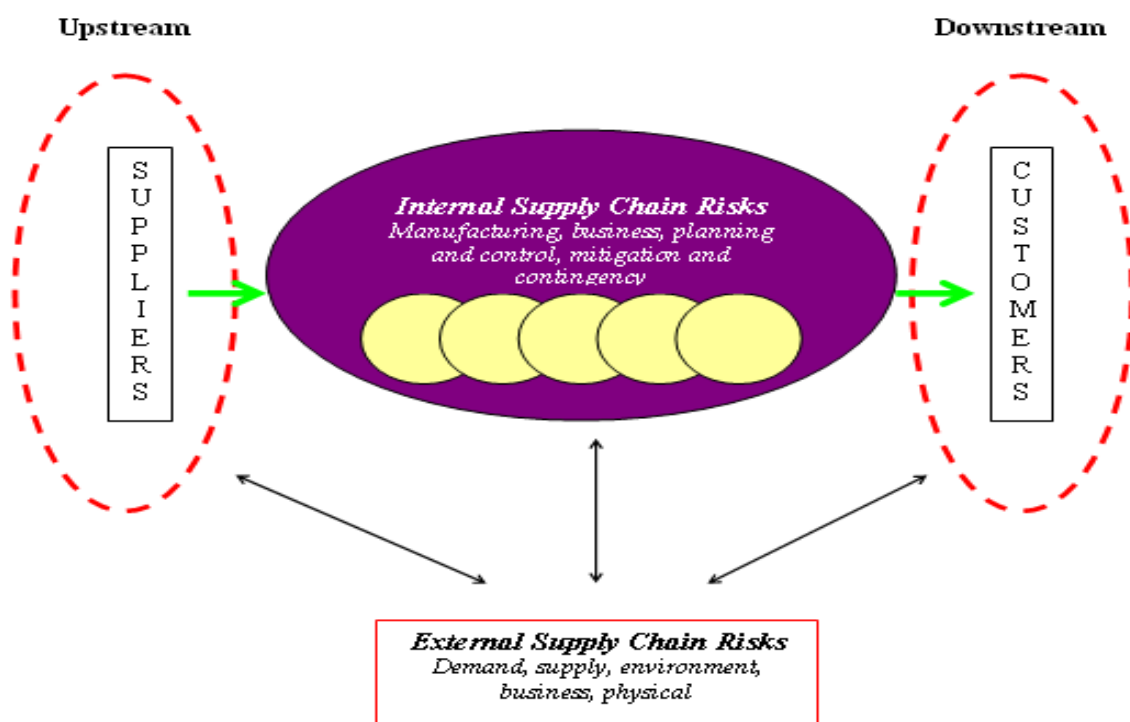


Figure 4. Supply Chain Risks illustration (Noppari 2009)

6.1.5 Risk Assessment

Risk assessment can be handled in several different ways, depending on the environment where the possible risks are thought to be coming from and also depending on the individual assessing the risks. However, what is common with different methods

of risk assessment is that they should always answer to three consecutive questions (Sheffi 2005: 272):

- 1) *What can go wrong?*
- 2) *How probable is it that an event will occur (internal or external)?*
- 3) *How significant will the consequences / outcomes / losses be?*

The given approach to assessing risk is quite a simple model, but an effective one. To clarify the first assessment question, is the probability of an event happening depends to some extent of the exposure to risk and some what on the likelihood of an action that will release the risk. A form of assessing risk or the level of risk a certain hazard exposes can be calculated through a formula designed to illustrate both the probability and the level of impact of a specific disaster. Below the equation for calculating how serious a risk is. After calculating, the higher the value R_h is the higher the risk, in other words this imposes a higher threat and the hazard specific vulnerabilities should be counter-measured with mitigation. How ever if there is no vulnerability there is no risk, for example if a volcano eruption would take place in the middle of the dessert where no inhabitants lived. (Wikipedia 2009)

$$\mathbf{R}_h = \mathbf{H} \times \mathbf{V}_h$$

Figure 5. Equation to calculating the level of risk a certain hazard imposes (Wikipedia, 2009) (*With the R_h being the risk, H presents the hazard and the V_h vulnerability*)

Risks in the supply chain of a single company can be controlled, prepared and forecasted easier than in a supply network. As companies are encouraged to shift supply chain more towards supply networks, to become more efficient one thing should be kept in mind; when more individuals make up an entity the possible risks increase. This is simply due to the networks becoming more complex and dynamic, which results in more cross-roads where something could go wrong. What should be strived for in supply networks is not only to decrease your own risks but to plan together as a whole network ways to minimize risks, and realize that in supply networks two matters should be kept in mind: mutual risk and benefit sharing. (Sheffi, 2005: 137 -154.)

Luckily a tool for managing supply network risk has been provided, this tool consists of six different steps that need to be carried out in-order to assess and manage risks in the vast networks. This tool does not work for a single company alone, but should be used as a tool to be applied in a joint effort with all the different partners in the supply chain.

6.1.6 Supply Chain Risk Management

Supply chain risk management can be broken down into six steps, according to *James Kiser* and *George Cantrell*. Kiser and Cantrell (2006) have defined what a good risk management strategy should be like in-order to work sufficiently to minimize setbacks to a company, if some disruptive event should occur in the supply chain. The risk management strategy should identify risks not only for a section of supply / production, but for the entire life-cycle of the product or service in question. It should be capable of estimating possible financial loss due to a crisis in the supply chain.

The designed strategies made to manage the risks with in the supply chain should have tools to mitigate the effects of any disruptions of supplies. Lastly an efficient risk management strategy concerning supply chain should be focused beyond the first tier. On the next page Figure 6 explains the six steps to managing supply chain risks, from the figure the process of managing risks can be better understood. (Kiser & Cantrell 2006: 12-17.)

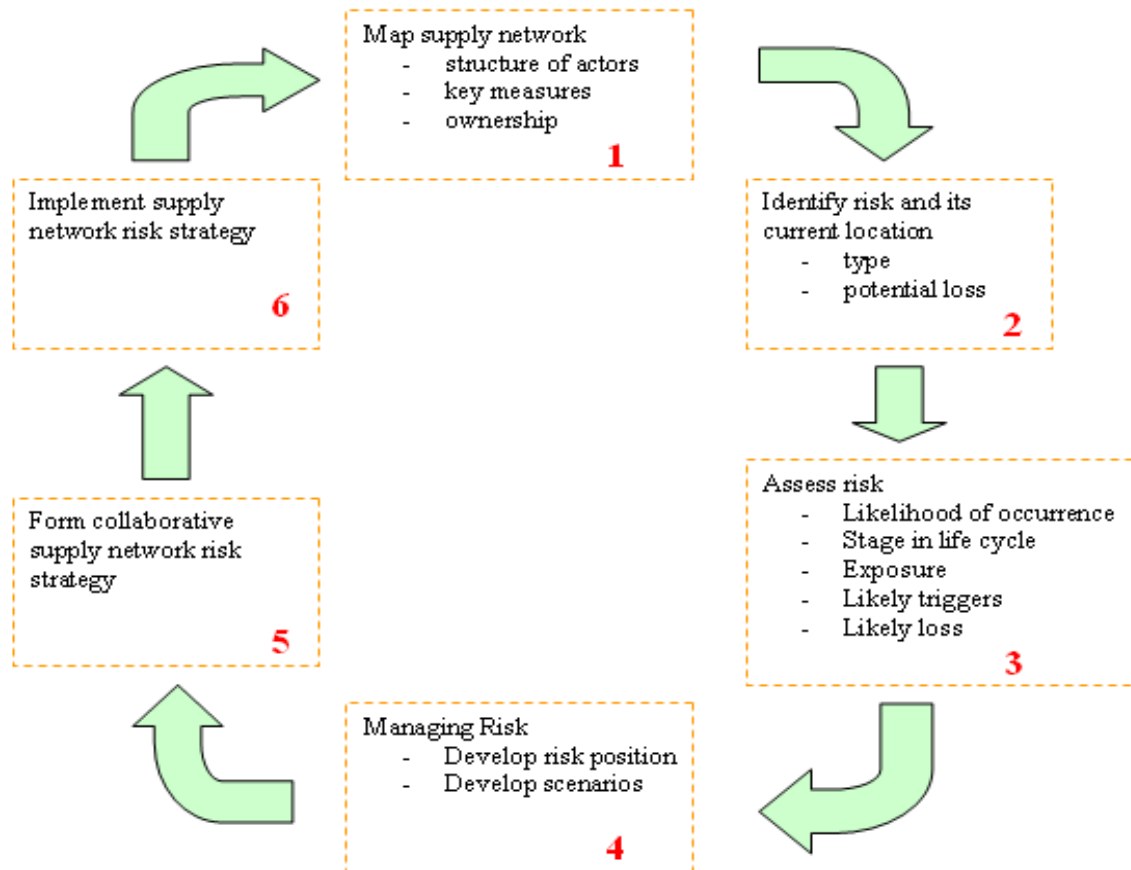


Figure 6. Tool for managing supply network risk (Hardland 2003)

When managing supply chain risks a few key steps on top of the above mentioned six step management tool, should be kept in mind. The key steps include seven steps that will lead to improved risk management, if implemented/understood correctly (the seven steps relate to the six step tool closely). When managing risks in the supply chain we should always begin by making sure that we 1. Understand the supply chain. Only after understanding we can begin to 2. Improve the supply chain. 3. Identify the critical paths (nodes and links). After identification we can begin 4. to Manage the critical paths, thus 5. Improving network visibility. After increased visibility a 6. Supply chain continuity team should be established. Finally after taking all of the above mentioned six steps we are ready for the seventh and final step; 7. Work with suppliers and customers to improve supply chain risk management procedures. (Christopher, 2005.)

Either with the help of the six stage risk management tool or the seven step approach, a supply network can begin to manage their risks more efficiently. What should be kept in mind is that the risks a supply network face affect everyone, thus risk management and assessment should always be carried through collectively.

6.1.7 Mitigate or not to Mitigate?

What is disaster mitigation? It can be said to be the process of preventing hazards and threats from forming into full scale disasters. Mitigation is also the process of trying to reduce the effects of disasters if they have already happened. What makes mitigation different from your “every day” risk management? Mitigation focuses to reducing or eliminating a certain risk completely through long-term measures and strategies. If mitigation strategies are applied after a disaster has happened it can be viewed to be part of the recovery process.

In theory the question of mitigate or not to mitigate can be compared to proactive vs. reactive management. The core question seems to be whether a company with a global supply chain for example should spend funds on preparing for possible disasters/disruptions and at the same time minimizing the likelihood of a certain risk happening. Or should the company simply just focus its efforts into reacting to a certain disaster if it happens. (Fasail, Banwet & Shankar 2006.)

Below given a short synopsis of a debate hosted and broadcasted by the British Broadcasting Corporation (BBC) in 2009. During the debate panelists discussed about preparing or reacting to disasters and the topic circled around the impact of disasters.

6.1.8 Example Case: BBC World Debate: Disasters – Prepare or React?

Panelists included:

Arjun Katoch: Chief, UN Disaster Assessment and Coordination team

Loren Legarda: Philippine Senator, possible presidential candidate and the UN champion of Disaster Risk Reduction in the Asia Pacific region.

Guido Bertolaso: Head of Italy's Civil Protection Agency.

Edward Borodzicz: Professor of risk management at Portsmouth Business School. Author of Risk, Crisis and Security Management.

It was interesting how the panellists differed in views on how to address risk in general. Should risk be mitigated, or should we just accept that a certain amount of risk will always be present? Should we rather focus efforts on preparing for dealing with the consequences of disasters, being more recovery oriented? Should governments spend large sums of money on mitigation, on building up rescue and recovery capabilities, or should we rather tell people how they can survive as long as possible if no rescue arrives, and in that manner reduce the impact of disasters to humanity? The basic message is that the government can only do so much; you have to do the rest yourself. On the other hand, the government must also provide the funds and opportunities, the legal and economical framework, for communities to prepare themselves. In essence, what the programme ended with was that while there is a mood towards preparing, reality often leaves us only one choice: to react. (BBC Extranet 2009.)

6.2 Demand chain management and networking

In the demand oriented flow of products the securing of the chain is important to maintain customer satisfaction, thus keeping the company alive. It is not only important to minimize your own risks, but to have your suppliers, their suppliers and so on to realize the importance of securing the whole chain. As the global supply- and demand chains tend to be more networks, rather than a chain consisting of individual parts, where the benefit of all parties should be number one priority and one should

not think of themselves as an individual player within the chain. With this sort of networking, risks can be managed more efficiently as a united entity. It should also be realized that if one supplier faces problems it will eventually have an effect on the whole chain, both upstream and downstream. This is why it has become so important to secure the whole chain as a unified procedure. (Sheffi, 2005: 93-111.)

What can also be achieved by minimizing risks and setting up contingency plans is that if something goes wrong, whether it be a mishap in transportation or a bigger scale natural disaster, with proper networking and co-operation the integrity of the supply/demand chain can be ensured resulting in better chances of continuity in operations and processes through out the chain. The field of emergency response logistics can do just that if taken seriously.

Transparency through the supply chain is a crucial factor for improved networking and communication. Making the supply chain transparent ensures that different individuals of the chain will be able to gather and collect information from each other both from downstream partners as well as partners further upstream. This will help prepare contingency plans in case of disruptions to the flow of materials in the chain. The transparency from top to bottom in the supply chain can enable a change from a reactive approach to proactive approach. The proactive vs. reactive approach can very well be a life-saving difference for a company when faced with a supply chain crisis. (Christopher, 2005.)

Creating a responsive supply chain does not only mean that the organization's supply chain will be better prepared to sudden disturbances to the chain internal or external. It also means that the supply chain will be more flexible to tackle issues accumulated from increasing volatility in demand. Supply chain agility acquired through responsiveness will help an organization to respond to changes in volume or variety in shorter time-frames compared to organizations with a stiff supply chain. The key to agility is to move as close to a just-in-time strategy as possible, this can be achieved through minimizing the levels of component inventory and work-in-progress goods. (Sheffi, 2005: 276-277.)

The effective supply chain can best respond to interruptions, therefore emergency response logistics is a crucial concept when keeping in mind that in a serious state of emergency a company must be able to ensure continuity of operations.

6.2.1 Four R's

For The supply/demand chain to be competitive and ensure best possible effectiveness, it should meet four different milestones. The chain should be Responsive, Resilient, Relationship oriented and lastly Reliable. If these four R's are kept in mind while designing a supply chain or a demand chain the chain is more likely to benefit the network of parties with-in the chain. When regarding emergency response logistics resilience is a crucial part of the equation. (Christopher, 2005.)

The four R's in short:

Responsiveness: A responsive chain offers flexibility and the chance to offer customized solutions to parties involved.

Resilience: The web of parties involved in the whole process and operations of the supply/demand chain is spun so that it can cope with abrupt unexpected disturbances.

Relationships: As the word indicates, buyer and supplier relationships should be based partnership.

Reliability: To ensure reliability the chain should have pipeline visibility to ensure that transparency.

With the help of the four R's ultimate customer satisfaction is within ones grasp. By keeping these concepts in mind it is easier to keep deliveries on-time, in-full and error-free. Below you can see a short case study of two different styles of supply chain management. From this case study one can see that it does pay to have a responsive, resilient, reliable, relationship oriented supply chain.

6.2.2 Creating Supply Chain Resilience

Achieving supply chain resilience is important for a company of any size, big or small. For no matter how well your supply chain is managed it will still be prone to unexpected turbulence or be impacted by events that are simply impossible to forecast, it is critical that resilience be built into the supply chain. Resilient processes are flexible and agile, and are able to change quickly.

Velocity alone is not enough – it is acceleration or the ability to ramp up or down quickly that matters. (Christopher, 2005.)

When thinking of emergency response logistics and disaster management, one can quickly understand the importance of the 4 R's and especially the need for a resilient supply chain. Through the emergence of ever more complex networks the access to information as rapidly as possible within that network is a key issue to achieving resilience. If information flow between individual bodies of the network is not sufficient, it will result in a rapidly spiralling chain of events ultimately leading into chaos; unless they can be connected through shared information and knowledge. The aim of this information integration process is to try and create a supply chain community where greater visibility of upstream and downstream risk profiles exists. It is also important to co-ordinate and commit to shared mitigation and manage those risks as an entity. (Christopher, 2005.)

The final issues in creating the resilient supply chain is to realise that when strategic decisions are taken, for example relocating facilities or changing sources of supply, the effects of those decisions on the supply chain risk profile must be fully understood; thus enabling for the company to prepare for possible disruptions and ensure business continuity if a disaster was to occur. Figure 7 summarizes the different steps and requirements that need to be in place for improving supply chain resilience.

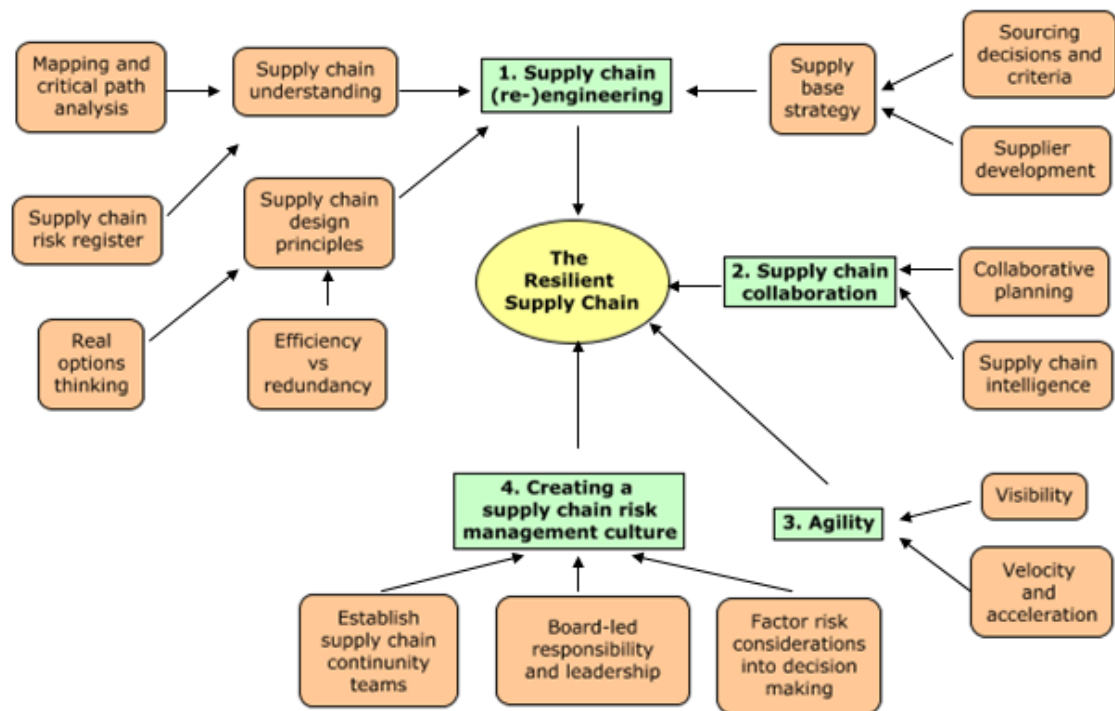


Figure 7. Creating the resilient supply chain (Christopher 2005.)

On the next page a short case study is presented of a real life supply chain disaster. From the case study one realizes how important supply chain resilience is and the utilization of the 4 R's.

6.2.3 Example Case: Nokia vs. Ericsson; Albuquerque, New Mexico, 2001

Albuquerque, New Mexico, 2001 a microchip plant owned by Philips burned down do to an accident caused by nature. A bolt of lighting struck a near by power-cable supplying the factory with electricity. After this a pearl string of events lead to a fire starting within the plant, causing massive damage to the microchips from smoke, water and heat, resulting in almost the whole stock of chips being defect. Due to these events two mobile phone companies supply chains were badly affected, Nokia from Finland and Ericsson from Sweden. This disaster eventually cost the Swedish based Ericsson \$400 million in lost sales because they were unable to react fast enough and secure the supply of microchips from third-party vendors. Ericsson had to quit the production of mobile phones, which resulted in Nokia becoming the European market leader.

The difference in the way the two similar companies handled the situation shows well how important supply chain risk management is. Ericsson, who was assured by representatives from Philips that the fire did not incur extensive damage and that everything would be back to normal shortly; Nokia on the other-hand did not rely solely on this information, but acquired further information on the matter and soon realized that the damage was larger than expected. After learning this Nokia acted swiftly to tackle the problem by ordering more microchips from the Philips plant in America. Nokia even made a decision to alter the structure of some of the phone models, so that it would be possible to use chips from Japanese and other American suppliers. By this quick response Nokia not only managed to save its operations, but also to strengthen its position in the market. This is a strong example of how supply chain risk management can ensure the continuity of business for a given company. (Norrman & Janson, 2004: 434-456; Eglin, 2003.)

From this example one can also begin to see the importance of transparency for the whole network of suppliers, vendors, producers etc. The flow of information should be as free as possible between partners and as truthful as possible. This will help build an optimal base for co-operation in the chain, so that all parties may execute their role in the chain to the best possible level.

6.3 Humanitarian Relief Chain Management

Humanitarian relief chains focus on ensuring the supply of food, water, help and other supplies to people that are in need of it. Usually the people and areas in need of this relief have been hit by natural disasters of larger scale. One could say that humanitarian logistics involves processes and systems needed to ensure the smooth and swift supply of people, resources, skills and knowledge needed to help vulnerable people affected by natural disasters and emergencies. Coordinating global help to individuals is often a challenging task and requires a lot of planning. In some ways the study of commercial supply chains can help in the planning of a relief chain and managing it. Below figure 8 illustrates an example relief chain.

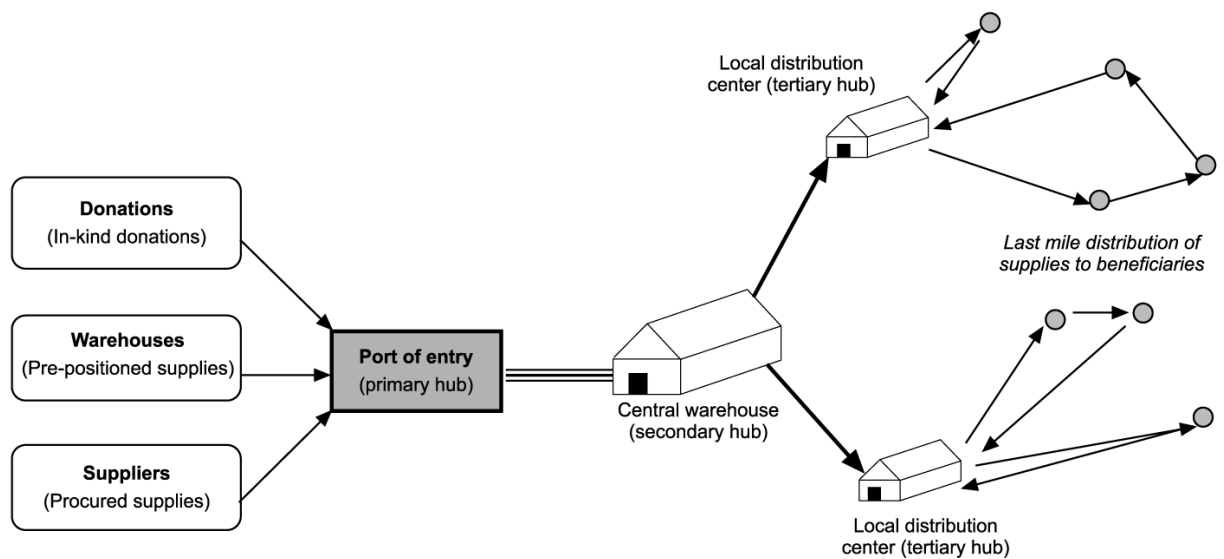


Figure 8. Example humanitarian relief chain (UNDP Disaster Management Training Programme, 2007.)

Humanitarian logistics operations include all the similar activities that relate also to commercial supply chain management. These operations include for example planning, procurement, human resource management, transportation management, customs clearance, inventory management, warehousing, collaboration with different parties, distribution and last mile distribution, and of course all of these operations need skilled professionals to over see them. (Baluch, 2007.)

6.3.1 Humanitarian Relief Chains vs. Commercial Supply Chains

Humanitarian relief chains are similar to the commercial supply chains. One major difference between the two, however, is the unpredictability of disasters and emergencies (e.g., volcano eruptions, earthquakes, floods etc.). When the commercial supply chains are more focused on optimizing the supply of goods and services; the humanitarian relief chains battle with the challenges of managing material flow in the relief chain. The objectives of the relief chains are to deliver the correct amount or number of people, goods, and monetary resources to locations worldwide in a timely manner. (Thomas, 2003.)

Another example of difference between the two chains is the demand patterns in the two chains. In the commercial chain, or in the vast majority, external demand for products and services is comparatively stable and predictable. This helps a lot in managing the chain and planning future strategies related to the process within the chain. Predictability also makes the management of risks a little easier in the commercial supply chains.

Humanitarian logistics is more demanding than corporate logistics, which affords more time for planning and strategizing. (Baluch, 2007.)

The demand in question of the relief chains are mainly people and supplies, these demands are often irregular, unpredictable and occur suddenly. This results in that the locations where relief is needed are often completely unknown until some kind of a disaster happens that results in demand. Despite that many of the concepts related to commercial supply chain management can be applied to humanitarian logistics, the unique characteristics of the humanitarian relief delivery process present many challenges. (Thomas, 2003.)

7. WORKING METHODS OF PROJECT IMPLEMENTATION

During the lifetime of this project several different working methods were used. These methods included brainstorming, discussions, meetings with possible partners, short benchmarking of an MBA programme abroad, reading about logistics and emergency response logistics and sending out a questionnaire to several key individuals. The most important work concerning the goal of this thesis was the meetings with possible partners.

Brainstorming was used in the very beginning of this project, but also during the process of writing the thesis. Through brainstorming a general idea of the concept was formed and the ways to reach the desired outcome of the thesis. Brainstorming helped to plot out for example the ideal network. Discussion with Dr. Bouhlal also helped with the process of writing this thesis; Dr. Bouhlal gave more ideas to the structure of the thesis and pointed towards worthy contacts, which should be contacted.

7.1 Meetings and discussions

As mentioned before one of the important goals and functions of this thesis is to promote and encourage discussion between different parties involved with the thesis. It is important that the matter of emergency response logistics is talked about, as very little related to the matter exists as of yet. The parties involved with the subject have been picked out especially for this and are all quite interested with the subject and idea behind the thesis.

The goal of the meetings was to generate interest in the different parties and then to get them involved with the programme in the future, if such a programme is started. After they would be part of the programme it would be easier to bring them together and start building a network between all parties involved, by having the different representatives meet and further exhaust the topic.

The thesis aims to promote discussion between involved parties to further prepare for any situations that require prompt actions in order to be dealt with both on a local and global scale. Of course one can not create precise plans for every single scenario, but all discussion of the subject will help prepare for the future and tackle possible problems. As one of the goals of this thesis is also to find out whether or not it would be plausible to organize an educational programme of emergency response logistics, awareness of the programme with the parties involved is crucial. This educational programme would benefit the entire region of Tampere and Finland. It would also be beneficial for the programme that parties from different sectors would participate in the education. This would give a lot of useful information to the alumni of the programme as each party would be able to teach about the issues they are best at and specialized in.

The parties seen include Tampere University of Technology, the National Emergency Supply Agency, TeliaSonera and the Red Cross of Finland. These parties were selected for the reason that they would benefit the education programme and the whole subject, as all parties can provide essential know-how from different perspectives.

7.1.1 Tampere University of Technology

Department of Business Information Management and Logistics

Discussion with Mr. Jorma Mäntynen, Professor on 31.3.2008

The first meeting with a third party was with Mr. Jorma Mäntynen of Tampere University of Technology. The first concerns about meeting a third party and introducing them with the concepts and ideas about emergency response logistics were soon forgotten as the response from Mr. Mäntynen was very open and he was clearly intrigued by the ideas presented to him. The meeting turned out to be quite successful as Mr. Mäntynen informed that he was interested in the project and willing to contribute to it – the networking had begun. Issues discussed in the meeting were more general matters about the whole project; as the situation was a great opportunity to test ideas and concepts generated so far. Some ideas that arose in the meeting were for example that when emergency response logistics was concerned a virtual warehouse would be very

useful; when thinking of the amount of material, equipment, medicines and so forth related in the operations. As stated already above the Technical University informed that they would be willing to be a part of this network and work together with the Tampere University of Applied Sciences in providing an educational programme about emergency response logistics. Discussions on what sort of a role the Technical University would have led to that the whole subject of emergency response logistics could be further broken down to an educational programme and a research programme. In this split scenario the Technical University would be involved more in the research side of the subject. This was a really good finding as through this research and development side new findings on the subject can be made and then taught on the educational side to the alum. Figure 9 illustrates the concrete dividing of the emergency response logistics.

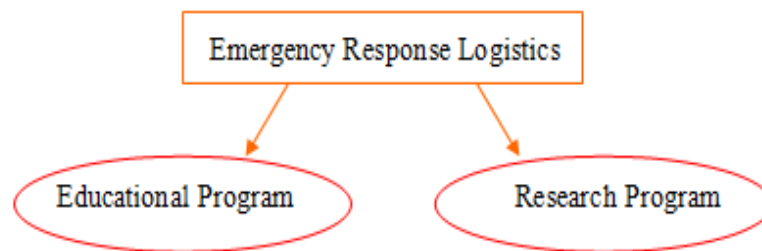


Figure 9. Brake down of Emergency Response Logistics (Noppiari 2008)

Some points that arose in the discussion:

- The education could be divided into two separate items, the educational programme and a research & development programme
- Technical solutions such as a virtual warehouse could be designed and utilized
- The Technical University could provide a lot of expertise in the research & development programme

After discussing these issues for a while, Mr. Mäntynen pointed that Mrs. Raija Viljanen of the National Emergency Supply Agency (NESA) will most likely be interested in the project as well; the importance and potential that NESA had been soon realized and a meeting scheduled with Mrs. Viljanen. All in all the meeting with the Technical University was a success and the true importance of the topic was realized.

7.1.2 National Emergency Supply Agency

Discussion with Mrs. Raija Viljanen, Special Advisor, Logistics on 9.4.2008

The second meeting was set up with the National Emergency Supply Agency. The National Emergency Supply Agency specializes in making back up plans and supply schemes for emergencies and exceptional times. This institution is closely related with the government, thus making it an important partner to have in the project. An emergency time can be, at its most extreme, a state of war. However, it is more likely that an emergency that needs special supply plans or logistical solutions is for example a larger power shortage or a long lasting strike at a seaport. During the meeting was also established that in the modern world a time of disorder may also be terrorism towards humans and infrastructure or cyber-terrorism against critical information systems. However terrorism can ironically be targeted towards logistics, this interesting point-of-view was discovered during the meeting. Take for example a group of terrorists or even a single individual looking to cause mayhem could call for instance the port of Rotterdam and say that there is a bomb in one of the containers. This can easily be done without any tracks to the person with the call being made from a pre-paid subscriber connection. This sort of a quick and easy strike would cause damages on a monetary basis instead of material damages (unless an actual bomb would explode inside the port). It would distort the transit of goods for a while, as most likely the port would shut temporarily down until the threat is taken care of.

The whole meeting went well with Mrs. Viljanen and she was really interested in the topic and said to support the thesis and project. Some materials were also obtained from Mrs. Viljanen that can be used in the thesis work. She also wished to be kept updated on the progress of the project and ask if any problems arose. Mrs. Viljanen also provided useful contacts regarding the topic.

Some points that arose in the discussion:

- Also discussed was that the business life and authorities should have better connections between one another
- The evolution of threats these days; like technological warfare, attacks on information systems (banks, ports, stock markets etc.)
- Proper knowledge of the operational environment to help prevent emergencies and to form a basis for tackling different situations

7.1.3 TeliaSonera**Discussion with Mr. Jarmo Koski, Head of Security on 9.5.2008**

The third meeting after meeting with the National Emergency Supply Agency was set-up with TeliaSonera. Reasons for choosing TeliaSonera were that as it was brought up in earlier discussions that technological warfare or terrorism will most likely increase in the coming years, an individual with knowledge about information systems security should be met. Thus the meeting with a “network security advisor”, Mr. Jarmo Koski, to advice in matters relating to technological threats and ways of implementing protective measures towards such attacks. After a few minutes of discussion Mr. Koski already proved to be useful for example he brought out that it is more likely for a sun dot to send an immobilizing electro magnetic pulse than an EMP bomb exploding some where. It is also quite challenging to prepare for an EMP as no special requirements have been outlined about what elements need to work after an EMP shock.

Discussion on what possible threats awaited to strike information systems led to the conclusion that threats may basically come from every where; some examples are the east or Africa. However, there is also a threat of criminal activities being done with in the boundaries of laws, as different kind of laws exists in different regions of the world. Globalization has also made the protection of networks more demanding as they are becoming more and more complex. The boundaries in the information flow with in different networks in multiple countries have diminished, thus stopping a viral worm for example is quite difficult.

On the right Figure 10. shows the old and new structure of networks, the star being the simpler structure of a network of the past and the diamond a more complex structure of today, as a result of globalization. It is a lot more challenging to cut off the flow of information in the diamond structured network if compared to the star structure.



Figure 10. The structure of earlier networks compared to the structure of modern global networks

(Noppiari 2008)

This risk can simply be prepared for by making sufficient back-up plans for various threatening situations. Despite all this Mr. Koski thought that it is very unlikely that a network could be overtaken through an attack.

All in all the meeting was very useful providing very important information of the IT side in emergency situations and threats that might cause a situation in need of emergency response logistics. Some general issues relating to technological infrastructure and emergencies were also discussed. Mr. Koski also showed great interest towards the project and topic and is willing to sacrifice personal time to help improve the project and act as a consultant to us in information systems security issues.

Some points that arose in the discussion:

- That although networking is a trend of the business world of today, it causes security issues when viruses and such are concerned
- That it would actually be more difficult to over take a network through attacking it, than often thought
- That virtual terrorism should be taken as a serious threat and contingency plans made to counter-attack possible threats

7.1.4 Finnish Red Cross

Discussion with Mr. Pertti Rantanen, Logistics Coordinator on 13.6.2008

The Finnish Red Cross was chosen next to have a meeting with, as they have a great amount of expertise in logistics relating to emergency response logistics through their experiences in humanitarian aid. Important views to the subject were discussed and this meeting, like every one of them, gave new insight in the matter of emergency response logistics.

According to Mr. Pertti Rantanen the different views of the national and international side of humanitarian aid should be brought together to form something more unified. This unified entity could then for example provide crisis management training, for example lasting a week, to individuals from different backgrounds to broaden the network of emergency response within the community. Soon after discussing about the matter the importance of the logistics centre was realized as the logistics centre is the only logistical warehouse of the Finnish Red Cross in Finland, through this centre most of the procurement is handled which illustrates its importance furthermore.

The Red Cross has some very interesting concepts in use that will be more than beneficial for this project and these concepts can easily be transferred from the humanitarian aid sector to the emergency response logistics sector, although these two fields already overlap to some extent. The operations of the Federation (combined Red Crosses) have 3 logistics centres and have a readiness level of stock for 5000 people. Some of the interesting concepts mentioned earlier are for example that the Red Cross has agreements between suppliers of goods that the suppliers have to maintain a certain level of inventory as a “just in case” security; this concept is called “vendor alertness”. This way the size of the warehouse of the Red Cross doesn’t have to be overly large and space and costs can be saved.

The meeting went well and Mr. Rantanen was interested in the project, but more on a personal level. The only thing he could say about the Red Cross participating in the project was that there is interest but time will tell how the Red Cross can realistically

participate in the project. At least for now the discussions have been opened with them and it will be easier in the future to continue to build a network with them.

Some points that arose in the discussion:

- When thinking of inventory management and humanitarian aid, a certain level of “vendor alertness” should be kept in mind
- Action should be taken towards building a network of emergency response within a community
- The importance of warehousing and inventory management in humanitarian aid logistics

7.2 Benchmarking: Coventry University

A short benchmark type of presentation was realised to be important concerning the final goal of this thesis. Coventry University is located in the heart of the United Kingdom and was chosen for its educational programmes; Disaster Management MSc and MBA Regeneration Management. Coventry University originates from as far back as 1843; however, it was until 1987 when the name Coventry University was taken into use. Information regarding the two programmes presented below was given by Joanne Harley, Marketing & Admissions Officer for Postgraduates Programmes. The information was received 6th of April 2009 in the form of two introduction brochures.

7.2.1 Disaster Management, MSc

The course is designed to introduce students to the key concepts and practices of disaster management. To equip students with needed tools to conduct thorough assessment of hazards, risks, vulnerability and capacity; for students to be able to objectively and critically evaluate and apply key elements of planning, but also management; to ensure the effective response to emergencies and disasters.

The Disaster Management, MSc programme at Coventry University is intended mainly for professionals from fields linked to disaster management. These include for example emergency planning, risk assessment, community development, humanitarian aid, capacity building and associated professions hoping to further deepen their knowledge and understanding of contemporary issues in disaster management, and the evolving risk scene.

The Disaster Management MSc course at Coventry University is designed to produce graduates with:

- Technical and management skills to enable graduates to contribute with a high level of competence;
- Knowledge of UK, European Union, United Nations and international disaster management policy and practice;
- Capacity to undertake risk and vulnerability assessment at an appropriate level;
- Knowledge of the legal and political framework of the UK, European Union, United Nations and international disaster management sector;
- Awareness of the social, political and environmental contexts of disaster management
- Abilities in independent investigation and research;
- Teamwork skill, thus facilitating the mobility of professional employment and the application of professional knowledge and skills across the world;
- Information management, communication and presentation skills

Study mode and assessment

The course at Coventry University consists of core modules and a thesis to rightfully receive the MSc, ten modules for a Post Graduate Diploma and five modules for a Post Graduate Certificate. The modules are taught as one week face-to-face contact teaching at the University (the modules comprise of lectures, workshops, seminars and exercises) followed by two weeks of directed and self-directed study for full-time students and five weeks for part-time students.

Course Content

The course runs fulltime for duration of one year. If one wishes to complete the course as part-time the course may last for duration of up to three years. Both cases consist of the taught modules and a final thesis. A Post Graduate diploma may be awarded where a thesis is not completed and a Post Graduate certificate where only five modules are completed.

Subject Areas

- Business Continuity Management
- Community and the Human Consequences of Disaster
- Disaster Management
- Disaster Theory
- Emergency and Disaster Planning
- Management of Human Caused Disasters
- Management of Urban Disasters
- Research Methods
- Risk Assessment
- The Management of Natural and Environmental Disasters

Future Prospects

The programme of Disaster Management is ideal for students hoping to chase an academic or research-oriented career, but also for those seeking employment within the public or private business sector. The course is designed to accommodate the ongoing professional commitments of practitioners and to equip them with the research skills, knowledge and management expertise.

Entrance Requirements

Applicants must normally hold a Second Class Honours degree in a relevant discipline. Applicants who demonstrate that they have considerable experience at an appropriate professional level but who do not hold the formal academic entrance requirements may be admitted, subject to an application and assessment. Applications to the course are encouraged from all suitably qualified people irrespective of age, race, gender or disability. The applications and admissions procedure conforms fully to the University's concerning Equal Opportunities. Applicants who are not native English speakers must provide the University with proof that he/she can follow instructions in English. This is normally 6.5 IELTS or equivalent.

(For contact details to the MSc programme see appendix 2)

7.2.2 Regeneration Management, MBA

The course of Regeneration Management allows participants to explore the dynamics of operation and strategy management, within the broader context of regeneration and sustainable communities. The programme is targeted mainly to managers working in the corresponding fields; regeneration, who have responsibility for designing policies and strategies to address decline and sustain growth in affected organisations and communities.

Regeneration is not a new field in business; however the competences now required at a management level are necessitating new skills from practitioners:

- How to manage complex projects
- How to make decisions under a high level of uncertainty
- How to develop strategies
- How to drive an innovative culture
- How to motivate workers
- How to facilitate the transfer and fostering of new knowledge

These are core strategic management competences relevant to regeneration practice that the course at Coventry University seeks to develop in students, through a blend of professional, business and academic training.

Coventry University has a long history of working in the field of regeneration and also holds a strong national and international reputation for teaching and research excellence in the field of regeneration. Their proficiency is grounded in academic, policy and practitioner approaches to the regeneration of towns, cities and communities.

At Coventry University the students participating in the MBA programme have an opportunity to work closely with national stakeholders to:

- Advance ideas and key debates
- Lead research and academic inquiry
- Develop policies
- Advise on area-based policies or strategies
- Provide new and continuing skill for practitioners

The MBA course at Coventry University is also supported by a team of respective partners, who include a team of more than 20 dedicated regeneration specialists, 20 business specialists, and ten industry specialists. It also benefits from the resources of the nationally recognised Centre in Sustainable Regeneration, the Business School and specialist facilities including dedicated library, computer labs, web-based and podcasting services and research seminar programmes.

Study Mode and Assessment

As a full-time student, one is expected to attend the University for two full terms for the Postgraduate Diploma. On top of that the student will have a four month time period, in which to complete his/hers Master's thesis.

The course can be studied in part time mode. Part time students are expected to attend for two years followed by an additional year reserved for the completion of the Master's thesis, which can be related to your employment. Alternatively some modules of the course can be studied off-campus through distance learning or activity-based learning, providing a blend of different learning experiences for students, but also easing the pressure of weekly attendance.

Course Content

The course of Regeneration Management consists of a taught phase, followed by an MBA phase (thesis).

Subject Areas

- Research Methods
- Human Resource Management
- Strategic Management
- Marketing
- Business Economics
- Financial Statement Analysis
- Sustainable Regeneration
- Contemporary Debates in Policy Design
- International Comparative Perspectives
- The Competitive City
- Rural Societies, Culture & Economies
- Theory, Dynamics and Processes of Economic Development
- The Regeneration Practitioner
- Company Internship
- Thesis / Dissertation

Future Prospects

The course is highly vocational preparing students the meticulous of high level regeneration practice. As the course is taught in co-operation with the Business Specialists, the course has been developed for managers and executives of regeneration organizations, boards and partnerships.

The course addresses the increasing demand for management skills for professionals working in the field of regeneration. More precisely it looks to provide exceptional educational experience, in which students can achieve an integrated understanding of the operation and strategy of management within the concepts of sustainable regeneration. The course also seeks to develop appropriate intellectual and personal skills; as such, the course is priceless for students new to management and those wishing to progress in the management field.

The course is suitable for:

- Chief Executives
- Programme Managers
- Strategists
- Executive Consultants

Entrance requirements

Successful applicants must normally hold at least a lower second class degree in Geography, Economics, Planning or a related subject. Applicants without a first degree, but with appropriate practical and/or professional experience will be considered for admission on merit.

Applicants to the course are encouraged from all suitably qualified persons irrespective of age, race, gender, or disability. The applications and admissions procedure conforms fully to the University's policy concerning Equal Opportunities. Applicants who

are not native English speakers must provide the University with proof that he/she can follow instructions in English. This is normally 6.5 IELTS or equivalent.

(For contact details to the MBA programme see appendix 2)

7.3 Questionnaire

A final working method was designing a structured questionnaire (Appendix 4) that was sent out to international key persons worldwide. These key persons were picked out by Dr. Anasse Bouhlal. They consisted of individuals who would most likely benefit the outcome of this project in one way or another. A structured questionnaire was used due to the reason that the identification of the key person's answers could be better traced in the process of global partner prospecting.

The core target of the questionnaire was to try and find out if there was any interest towards the end goal of the thesis. The key persons, if interested, would also become aware of the educational programme being put up at TAMK. Another goal of the questionnaire was to build a basis for a larger network, an array of global partners working together among issues related to emergency response logistics. As already mentioned earlier the questionnaire was also comprised to answer some of the crucial questions relating to the thesis; the questions were what could the contents of teaching include? Could the teaching be carried out in co-operation with a network of partners? Who would comprise this network? The questionnaire was designed so that it would give some clues to what the selected individuals feel about emergency response logistics and organizing an educational programme of the subject.

The questionnaire was composed online with the help of free survey software provided by www.surveymonkey.com. A covering letter (Appendix 3) was sent to key individuals that are located for example in South America, Europe, Asia, Africa and the Mediterranean area, the cover letter was sent in the form of an e-mail. The e-mail consisted of a short explanation what this thesis is about and why the answering of the questionnaire would be of great importance; at the end of the e-mail a link to the

online survey was included. As soon as the questionnaire was filled out the results would automatically be saved in the server provided by SurveyMonkey for more in depth analysis. The data collected was saved in numerical form, which was then analyzed using statistical methods, provided by SurveyMonkey. The results of the questionnaire and analysis of the data will be presented further on in chapter 7.2.

8. PROJECT DELIVERABLES

This chapter describes the project deliverables. In addition the network of partners can be counted as an output of the thesis. A network was put together and the different representatives were brought together, to further discuss the opportunities and issues relating to Emergency Response Logistics module. The partners with TAMK included previously presented organisations: Tampere University of Technology, the National Emergency Supply Agency, TeliaSonera and the Red Cross of Finland. In this chapter the three emergency response logistics courses will be presented shortly.

8.1 Emergency Response Logistics Courses

The output of this thesis so far has been a Disaster and Emergency Supply Chain Module, which is in total worth 10 ECTS for the students participating in it. The module is executed in co-operation with the Tampere University of Technology. Students from both TAMK and TUT will be able to choose the courses into their curriculum. This topic of teaching is completely new at TAMK and has not been taught before, which makes the new module interesting and current. The three courses can either be completed as a single entity or a student may choose one out three or two out of three courses. The courses will take place in the second, third and fourth period.

1. *Supply Chain Management in Disaster and Emergency Operations (4 ECTS)*
2. *Emergency Logistics Information Systems (3 ECTS)*
3. *Emergencies and Disaster Management (3 ECTS)*

In short, graduates should be able to combine their knowledge of commercial logistics operations and other areas of emergency and crisis management empowering them to the successful management, planning and implementation of emergency logistics processes (contingencies) and to help them improve cross-border dialogue and cooperation as well as national collaboration between the public sector and private sector together with governmental organizations and the Defence Forces.

The benefits of an employee with this type of education would be many. First of all today's business environment has evolved to the stage of globalisation that large companies necessarily do not have roots in any country but in many countries. This creates a sense of interdependency between the infrastructures of different countries. It also creates challenges for companies operating in e.g. third world countries where natural disasters may occur more frequently than in their so called home country such as Finland. To ensure competitiveness for both the companies operating globally but also the countries they operate in, we need to ensure the effectiveness and stability of their supply chains. With global supply chains they become exceptionally vulnerable to changes that could jeopardize their market share, profit and ultimately the previously mentioned competitiveness, which would ultimately have devastating effects on regional economic stability and development.

As a conclusion the beneficiaries of this type of education would be (besides the actual graduates) local and global companies, governments, governmental organizations as well as international relief organizations such as the UN or the Red Cross. If we look at the issue of stakeholder benefits on a more local scale, we could think what the city of Tampere and the network of partners involved would improve their status both nationally and internationally as there is a large gap in the education related to this field of study. Ultimately the programme would also provide graduates with a new competence and knowledge base to the job markets (appendix 5), thus the Finnish quality of education and workers could be brought out even more.

8.1.1 Supply Chain Management in Disaster and Emergency Operations

Goals of the course

Focus on designing robust supply chain processes (procurement, transportation, warehousing, inventory, distribution, fleet management) capable of effectively fulfilling needs in highly complex and challenging environments. Also to highlight the model-

ing and development of optimization, but also to simulation methods for improved strategic, operational and tactical decisions.

Subject Areas

- Introduction to disasters, Emergencies, and the Relief Chain
- Emergency Logistics Strategies
- Locating Facilities and Temporary Settlement Planning
- Emergency Performance Measurement
- Fleet Management: Air and Sea transport
- Procurement (e-procurement)
- Inventory Management
- Customs operations
- Security

8.1.2 Emergency Logistics Information Systems

Goals of the Course

This part covers the principles of the advanced information technologies and their applications in the field of emergency logistics.

Subject Areas

- Emergencies Information Techniques
- Geographic information System: e-maps
- Joint Supply Trucking
- Spatial Data Infrastructure for Transport
- Integration of Enterprise Resource Planning (ERP), Warehouse Management Systems (WMS) and Transportation Management Systems (TMS)
- Emergency Logistics Field Operations Manual

8.1.3 Emergencies and Disasters Management

Goals of the Course

Provide contextual background on how events and processes can lead to humanitarian crisis through exploration of the interplay of geopolitical, macroeconomic, demographic, cultural, social, legal, and financial conditions. This part of the module also covers the principles of project management and advanced methods for effective scenario planning, scheduling, resource deployment, allocation, control and reporting in humanitarian relief operations.

Subject Areas

- International Civil Law
- First Aid 1 and 2
- International Humanitarian Organizations -
- Intercultural issues
- Project Management in Emergencies
- Environmental issues

8.2 Establishment of Emergency Response Logistics Network

One of the important outputs of this thesis was the network it created. During this project several different, relevant to the issue, parties were approached and introduced to the concept of this thesis. These, as already mentioned, included the Tampere University of Technology, the National Emergency Supply Agency, TeliaSonera and the Red Cross of Finland. All representatives of the organisations that were seen showed keen interest in the project.

With the help of this network studies are to be started in the field of Emergency Response Logistics. Firstly as a more minimal module and hopefully as more parties are invited to the network the end result would be an internationally recognized MBA programme in Disaster Management, supported by several different big organisations,

both global and local. On the next page Figure 11 illustrates the optimal network of partners in all the three different levels; Global environment, National environment and the Local environment.

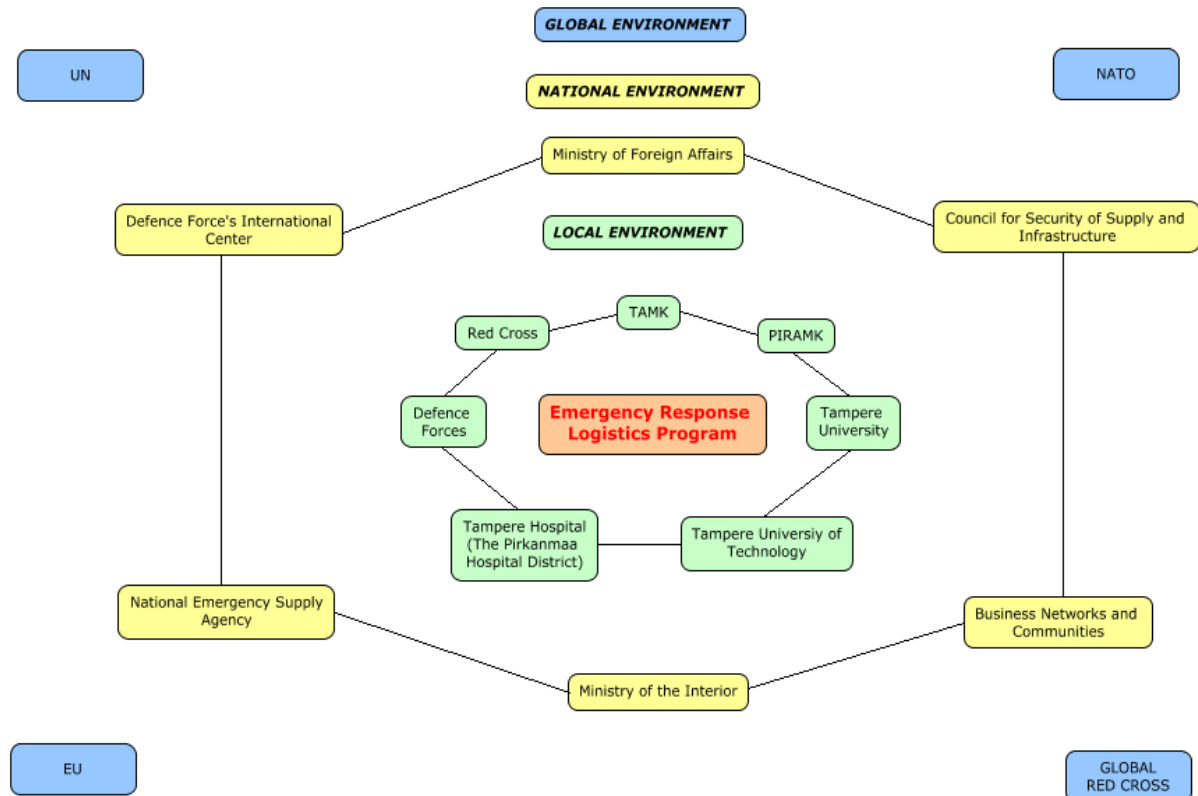


Figure 11. Optimal parties involved diagram (Noppiari 2009)

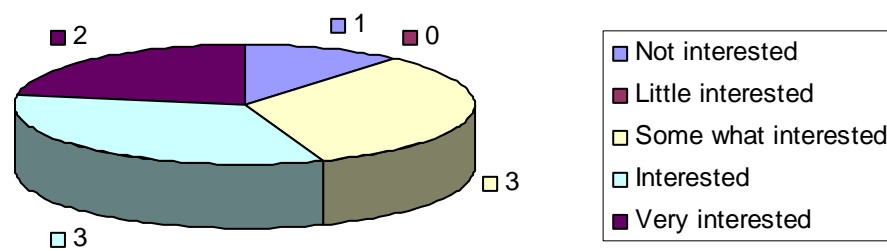
So far all of the partners seen relating to this thesis can be found from the network structure; TeliaSonera is incorporated into the “Business Networks and Communities” box. With the help of the questionnaire it is hoped that awareness of the project is generated in selected key individuals and the base for a larger global network built.

8.2.1 Results of the questionnaire

The questionnaire was designed so that it would measure interest in emergency response logistics programme among key individuals. The questionnaire was also targeted to further inquire how these key individuals would be interested to help with the

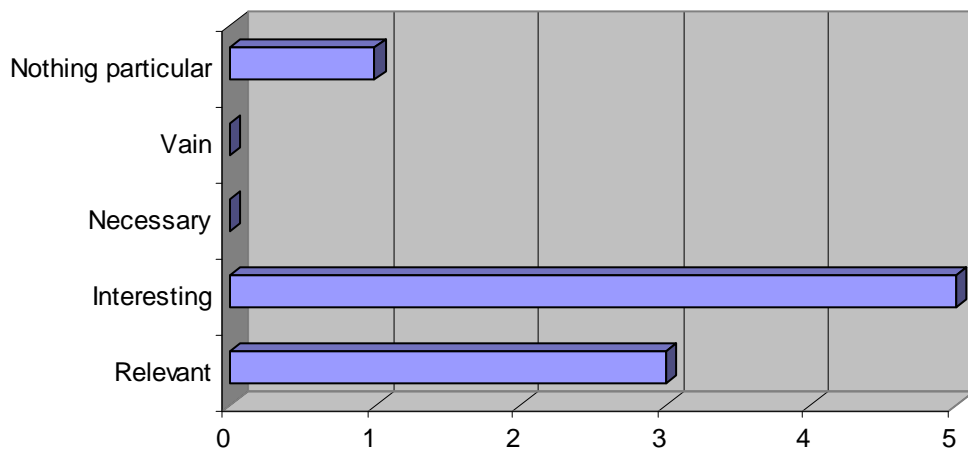
content of the studies. Total nine key individuals from different fields answered the questionnaire. Only one individual wanted to stay completely anonymous but the others stated their name, occupation and organization (Appendix 6). The results are presented in the tables below.

Table 1. Interest in emergency logistics programme.



All nine individuals answered this question. Majority of the answers are falling to “Interested” and “Some what interested” categories. On a scale of 1 – 5 (1 being not interested and 5 being very interested) the average climbed to 3.56 that is fairly good.

Table 2. Emergency response logistics programme relevance.



Again all nine individuals answered this question, which inquired on thoughts that emergency response logistics brought to the key individuals minds. All except one regarded the programme interesting or relevant.

Table 3. Type of interest in programme (multiple choices accepted).

	Response count	Response percent
To send individuals for study purposes.	2	22 %
To be part of developing such a programme.	4	44 %
Take part in research and development.	1	11 %
To receive information on the subject, but not participate actively.	5	56 %

Question four was designed to measure the type of interest in the programme. The result shows that significant part of responders is interested in developing the content of the programme.

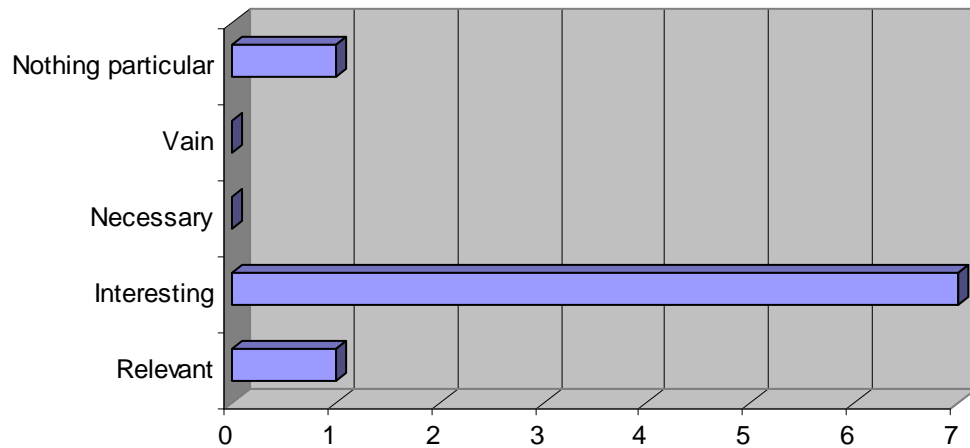
Table 4. Type of contribution for emergency response logistics programme.

	Response count	Response percent
Provide case materials on disasters etc. that could be used as examples during teaching.	0	0 %
Provide expertise advice by sending specialist to help design the curriculum.	2	33 %
Take part in teaching, for example as a guest lecturer.	4	67 %
By providing funding / sponsorship to the programme.	0	0 %

Two of the nine responders would be willing to provide expertise advice by sending specialists to help design the curriculum of the education programme. Total four would be interested in taking part in the actual teaching, for example as a guest lecturer. Three individuals skipped this question. The following question further investigated the willingness and type for contributing to research and development of emergency response logistics. Two were interested in providing personnel to help with the design of research methods. In addition three were interested in providing example cases on supply chain disasters.

Question number seven was measuring the interest in developing a global forecasting model to prepare for disasters. Six responders were not interested while three were interested.

Table 5. Forecasting model relevance.



The result of question eight is presented in the table 5 above. This question was measuring the relevance of the idea of a forecasting model. Seven out of nine regarded the idea to be interesting. One was thinking that the model is relevant while only one did show no interest at all.

9. Conclusions and Analysis

The basis of this thesis was to help improve the logistics education at TAMK and to find out whether or not it would be plausible to design and offer a new module. After thorough planning *Emergency Response Logistics* was chosen as the new educational topic. Theoretical information was searched in-order to outline the content of such an educational module.

Secondly the basis of this thesis was to design a network around the educational programme, to help improve the level of teaching and generate further discussion around emergency response logistics. The network was drafted and key individuals representing desired partner organizations were interviewed. All of the parties seen showed interest towards the topic and concept of this thesis, thus a network of partners was established.

Thirdly a questionnaire was sent out to several key individuals to find out their thoughts on this thesis and the concept of emergency response logistics. The aim of the questionnaire was to promote awareness of this project in international parties, thus giving the future possibilities to extend the national network into an international network.

The results of the questionnaire clearly showed that interest towards the subject and the goal of this thesis existed among the key individuals. Only one of the nine responses was anonymous. Through this questionnaire awareness was raised again in possible future international partners and contributors, which was one of the goals of the project.

This thesis has not only developed the education offered by TAMK but it has greatly affected myself personally and developed my skills. The project taught a lot, as it was quite abstract in the beginning; I received valuable experience of real-life project management. During the process I learnt a lot about myself when thinking of working on a larger project like this. Keeping my own time schedules was my main challenge dur-

ing the whole process. Now that the thesis is complete I believe I have improved in that field. Throughout the process I also absorbed loads of valuable information relating to supply chain management, disaster management, emergency response logistics and networking. So far I have not really known what in supply chain management and logistics interests me. However, now that I have discovered more about themes revolving around this thesis I believe that I have found my calling. I became truly fascinated in disaster management and risk management within the supply chain, actually so much that I want to pursue an international career in the field and further educate myself with an MSc degree in disaster management.

All in all the whole process of writing this thesis was educative and honestly quite fun. I really enjoyed writing and at the same time learning about the issues being handled in the thesis. I also met important people and learned valuable skills of networking as I experienced networking myself. I hope that in the future I could be working on related issues with a similar type of network.

Recommendations regarding future prospects

Based on the achievements of this thesis and the structure built around the emergency response logistics, possibilities to evolve the teaching module and network into something much bigger is in no doubt possible. As already stated earlier, even one of the long-term goals was to design and implement a new MBA level education programme at TAMK, based on this thesis. The possible emergency response logistics MBA programme could be offered to students and employees coming from a wide range of countries all over the world, thus increasing consciousness about TAMK, Tampere and Finland. The phenomena of social networking, which has risen to be a trend in the business world of today, can be applied in the programme, thus making it versatile and up to date.

To further illustrate the importance of networking are the comments made by the different specialists that were met and introduced to the educational programme. For example during discussion with Pertti Rantanen he pointed out that action should be taken towards building a network of emergency response within a community, this has

now been started as a result of this thesis. Raija Viljanen commented that the business life and authorities should have better connections between one another. To further illustrate the importance of forming such a network can easily be realized through the strategy recommendations that The Fritz institute has made regarding the improvement of humanitarian logistics. All together there are five recommendations, which of three have been presented below.

1. *Creating a professional logistics community will enable humanitarian logisticians to share knowledge and experience on common issues and to create a consistent, powerful voice with all the stakeholders in the sector.*
 2. *Investing in standardized training and certification will help build a pool of logistics professionals that share common processes and vocabulary, promoting professionalism and collaboration*
 3. *Communicating the strategic importance of logistics will enable logisticians to create awareness of the contribution that logistics makes and to obtain needed funding and resources.*
- (Baluch, 2007.)*

Do to these facts the educational programme holds great opportunities in the future. Through meetings, work and research the network of emergency response logistics can be enlarged even more. The on going process of building such a network is strongly recommended for the Tampere University of Applied Sciences and Tampere University of Technology. As a matter of fact the building of the network has already continued with meetings with The Ministry of the Emergency Situations, Russia (EMERCOM). EMERCOM Russia¹ is of immense importance to the educational programme, to TAMK and the field of emergency response logistics in general, when

¹ EMERCOM Russia was established on January 10, 1994. Some tasks of EMERCOM Russia include: directing activities aimed at eliminating the consequences of large-scale disasters, catastrophes and other emergencies, supervising the use of finance resources allocated to the Government for disaster management and response, organizing the training of the population, and governing agencies and the Russian System of Disaster Management forces for disaster management and response. As one can see, EMERCOM is of great importance as a partner.

keeping in mind that discussion of emergency response logistics must be generated between different parties.

The building of the network can also be continued as this thesis has opened doorways between TAMK and key persons. Discussion on emergency response logistics and related issues is made easier as awareness of the subject has improved between individuals. With the help of the network and individual specialists from different background and fields a research and development unit can be established alongside the multi-professional educational programme. One object of this research and development unit would be to try and figure out if it would be possible to design a global forecasting model to prepare for disasters.

The emergency response logistics could be applied in different type of future crises. One concrete example of this is the pandemic, swine flu, which is roaming all over the world at the moment. The vaccination is a vast international and national logistical challenge. Frankly speaking for example in Finland the supply and process of giving vaccinations has caused a lot of trouble. Emergency response logistics and disaster management research and study can provide help to manage various future crises.

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Appendices

Appendix 1: Short introduction of the MEDA-Institute

The MEDA-Institute is an independent, non-political organization founded in 2005. The institute seeks to support collaboration with the Mediterranean countries within the framework of the Barcelona process. The MEDA-Institute provides Finnish institutions, organizations and NGOs with information concerning the Mediterranean region, with the ultimate goal being to promote co-operation in matters of business, educational and research activities. The institute uses a portal that has been created with the help of experts from the Mediterranean region. The portal provides information on business activities mainly in the southern Mediterranean region. (www.medainstitute.fi)

The core activities of the MEDA Institute are:

- Monitoring economic development in the southern part of the Mediterranean region
- Managing and coordinating EU-funded projects
- Providing customized business services for Finnish and European companies
- Conducting high-quality applied research

The sectors in which the MEDA-Institute is involved are:

- Transport and Logistics
- Environmental development
- Small and medium-sized enterprises
- Information and communication technologies
- Health and social services
- The textile industry

The MEDA-Institute is committed to offering high-level services and knowledge in the following languages: Finnish, English, French, Spanish, Portuguese, Russian and Arabic

Appendix 2: Coventry University Contact Details

Contact Details MSc

UK and EU students:

The Graduate Centre
Coventry University
Priory Street
Coventry
CV1 5FB
UK

Telephone: +44 (0)24 7688 7667
(or +44 (0)24 7688 8382
or +44 (0)24 7688 8071)
Fax: +44 (0)24 7688 8609
E-mail: postgraduate@coventry.ac.uk

International students:

International Office
Coventry University
Priory Street
Coventry
CV1 5FB
UK

Telephone: +44 (0)24 7688 8674
Fax: +44 (0)24 7663 2710
E-mail: interlink@coventry.ac.uk
Worldwide Web
www.coventry.ac.uk

Contact Details MBA

UK and EU students:

The Graduate & CPD Centre
Coventry University
Priory Street
Coventry
CV1 5FB
UK

Telephone: +44 (0)24 7688 7667
(or +44 (0)24 7688 8382
or +44 (0)24 7688 8071)
Fax: +44 (0)24 7688 8609
E-mail: postgraduate@coventry.ac.uk

International students:

International Office
Coventry University
Priory Street
Coventry
CV1 5FB
UK

Telephone: +44 (0)24 7688 8674
Fax: +44 (0)24 7663 2710
E-mail: enquiries.io@coventry.ac.uk
Worldwide Web
www.coventry.ac.uk

Appendix 3: Cover letter sent to international key persons

Dear Sir / Madame

I am currently finishing my final thesis and would greatly respect you reading this email and answering a short questionnaire regarding Emergency Response Logistics. The whole process should not take more than five (5) minutes. Your prompt answers will be appreciated!

Final Thesis: Emergency Response Logistics

This email is sent on the behalf of TAMK University of Applied Sciences and Tampere Technical University and concerns a new training programme called Emergency Response Logistics. You might already have been approached by Dr. Anasse Bouhlal (TAMK University of Applied Science) on behalf of the subject.

TAMK has been developing a programme for Emergency Response Logistics to be taught in cooperation with the Tampere University of Technology. The programme will address the issues of planning and preparation for disasters, catastrophes and crises. Emphasis will be placed on ensuring supply chain responsiveness and the continuity of operations in order to cope with potential disruptions, and also to ensure the proper planning and readiness for different hazards that may occur on both a global and national scale.

An integral part of the development of a successful programme is the creation of a global network of partners to provide their own insight into the subject. The ultimate goal of this network would be, not only to create a working programme for the education of professionals on the subject matter, but also to create an integrated global model for preparing and forecasting (Global forecasting model) different crises and catastrophes to reduce the lead-time for humanitarian aid, thus reducing the amount of damage caused significantly.

This email contains a questionnaire as a link. I would respect your answers greatly. The subject itself is of great importance to nations and companies, making your contribution invaluable to the overall success. Only by creating a global network of part-

ners are we truly able to create the best way of preparing for crises, whether global or local.

I would like to offer my recognition for your input and will respect your responses greatly! I will keep you informed on further developments on the programme if this is your wish! Each response is a step forward.

LINK TO QUESTIONAIRE:

http://www.surveymonkey.com/s.aspx?sm=_2bDglG6vYqhle8B0Wr15I5w_3d_3d

With Sincere Gratitude,

Perttu Noppari

Perttu Noppari

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FI - 33520 TAMPERE

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perttu.noppari@cs.tamk.fi

+358 40 700 9663

Appendix 4: Questionnaire sent to international key persons

Referring to the covering letter of Emergency Response Logistics

Emergency Response Logistics Questionnaire

1. Name: _____
 Occupation: _____
 Organization : _____

2. How interested would you be in *the Emergency Response Logistics programme*?

1	2	3	4	5
not	little	some what	interested	very
interested	interested	interested		interested

3. What thoughts does *the Emergency Response Logistics programme* bring to you?

- A. Relevant
- B. Interesting
- C. Necessary
- D. Vain
- E. Nothing particular

4. In what way would you be interested in the Emergency Response Logistics programme?

- A. To send individuals for study purposes
- B. To be part of developing such a programme
- C. Take part in research and development
- D. To receive information on the subject, but not participate actively

5. If you would be ready to contribute in the Emergency Response Logistics programme, how could you do that?

- A. Provide case materials on disasters etc. that could be used as examples during teaching
- B. Provide expertise advice by sending specialists to help design the curriculum
- C. Take part in the teaching, for example as a guest lecturer
- D. By providing funding / sponsorship to the programme

6. If you would be ready to contribute to the research and development of the Emergency Response Logistics, how could you do that?

- A. Provide personnel to help with the designing of research methods
- B. Provide example cases on supply chain disasters
- C. By providing funding / sponsorship to the programme
- D. Provide alumni with thesis subjects / cases

7. Would you be interested to develop a **global forecasting model** to prepare for disasters?

Yes No

8. What thoughts does the **global forecasting model** bring you?

- A. Relevant
- B. Interesting
- C. Necessary
- D. Vain
- E. Nothing particular

Appendix 5: Possible occupations of the graduates

Possible occupations of graduates of the emergency response logistics programme

- Determining risks, Information gathering & analysis
- R & D related to emergency response logistics and contingency planning (private and public sectors)
- Acting as intermediaries enhancing the cooperation and collaboration between actors related to this sector (combining both private and public operations) as well as increasing dialogue between them
- Risk Planning, Profiling and Assessment: Determining risks, prioritising infrastructure, determining critical infrastructure (macro and micro levels)
- Risk management in local or global supply chains
- Work as a strategist in the field of business continuity planning
- Creating plans for adverse situations, contingency plans for companies: maintaining, updating and revising. (Contingency Plan Management)
- Enhancing international cooperation, collaboration and dialogue between different organizations and actors on a global scale
- Acting as a logistics coordinator e.g. in a global help organization such as the Red Cross or other Emergency Response oriented company.
- Working for the government in relation to civil crisis management and emergency response contingencies
- Working as a consultant developing contingency plans ensuring the functionality of their supply chains (local and global) in case of an adverse situation or crisis situation
- Using the theoretical and practical knowledge of business logistics and applications for use related to operations involved in crisis management, contingency planning, ensuring the integrity of critical infrastructure and security of supply
- Application of technology and IT –systems in the field to enhance aforementioned subjects, shorten lead times (and response times), enhance risk evaluation, surveillance and management
- Improving cross-border communication, cooperation and collaboration – both between the private and public sectors
- Managing the logistic processes involved when dealing with crisis, emergency or other adverse situations (humanitarian aid, power grid failure, flood, weather etc)

Appendix 6. List of key individuals' organizations and occupations

Jorma Mäntynen

Professor

Tampere University of Technology

Raija Viljanen

Logistics Manager

Huoltovarmuuskeskus (National Emergency Supply Agency, NESAs)

Kremser Wolfgang

Head of Business School

Vorarlberg University of Applied Sciences

Dr. Efraim Laor

Disaster Manager, UNDAC Team-Member, Founder & lecturer, Masters' & Ph.D. Programme in "Confronting Large-Scale-Sudden-Disasters [LSSD's]", University of Haifa, Israel. Chairman, "Fast Israeli Rescue & Search Team" [F.I.R.S.T.] Former Chairperson, GOI Steering Committee for Disaster Reduction

Sanna Nieminen

Senior Lecturer, JAMK

Vladimir Maslarov

Logistics Officer

IOM

Paul Catteuw

Lecturer

Karel de Grote-Hogeschool