Case study LCW

"how can potential added value of cooperation in a network be effectuated to benefit the own internal organisation?"

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Case Study LCW

“How can potential added value of cooperation in a network be effectuated to benefit the own internal organisation?”

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in partial fulfilment of the requirements for the degree of

Master of Science
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Abstract

During this Master Thesis program, a case study with respect to network cooperation had been executed in order to give recommendations to Logistic Centre Woensdrecht (LCW). LCW is the Military Logistic Centre in the Netherlands, that ensures the availability of air-based and other weapon systems and ground based communication systems for carrying out operational tasks. LCW is part of the Defence Material Organizations (DMO) in the Netherlands, which is related to the Royal Dutch Air Force, the Royal Dutch Navy and the Royal Dutch Army. Underlying this case study several initiatives based on Public Private Partnerships (alliances) have been studied as related to several large transitions and overall trends in the European and Dutch Defence Industry.
Acknowledgements

This report is part of a Master Thesis Program in ‘Innovation Management’, at Eindhoven University of Technology, The Netherlands, Department of Industrial Engineering & Innovation Sciences, Division: Innovation, Technology Entrepreneurship & Marketing (ITEM). During this Master Thesis program, a case study with respect to network cooperation had been executed in cooperation with Logistic Centre Woensdrecht (LCW).

Without the support and guidance of my supervisors, I would not have reached this result. I am very grateful for the opportunities, challenges, support and advice given during my thesis project. First of all, I would like to thank Prof. Dr. Geert Duijsters, my first supervisor from the Eindhoven University of Technology, whose effort gave me a lot of support during my entire graduation project and who was always willing to schedule time for an appointment and to evaluate my work and processes. I am also greatly indebted to Dr. Myriam Cloodt, my second supervisor from the Eindhoven University of Technology, whose help, stimulating suggestions and encouragement helped me to get extra perspectives on scientific literature, the courses chosen in my international semester and case study methodologies used. I owe much gratitude to Colonel Ir. Ing. Johan Kaelen and Msc. Drs. Jeroen Maurer, respectively my first and second supervisors at LCW, who gave me the opportunity to do the necessary investigations, collect the input required and support me to accomplish this overall project. I also want to thank General-Major Mr. S. van Groningen, Former Commander-Director LCW, and Air Commander ir. E.C.G.J. Van Duren, Director LCW, for introducing me to my supervisors at LCW and giving me the opportunity and permission to commence this case study in the first instance.

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Not only regarding the entire graduation project, but also with regard to the final years of my study, I can really look back on an intensive, challenging, instructive and wonderful life time, which is definitely an additional value with regard to my former studies in technology. Therefore, and in combination with the things I experienced, I would want to make the effort to finally focus on and participate in the development of new technologies and instruments directly and indirectly related to product and process innovations in the Medical sector.

Koen van Agtmal
August, 2009
Management Summary

Introduction Case study LCW

This report is part of a Master Thesis Program in ‘Innovation Management’, at Eindhoven University of Technology (The Netherlands), Department of Industrial Engineering & Innovation Sciences, Division Innovation, Technology Entrepreneurship & Marketing (ITEM). During this Master Thesis program, a case study with respect to network cooperation had been executed in order to give recommendations to Logistic Centre Woensdrecht (LCW). LCW is the military Logistic Centre in the Netherlands, that ensures the availability of air-based and other weapon systems and ground based communication systems for carrying out operational tasks. LCW is part of the Defence Materiel Organisation (DMO) in the Netherlands, which is related to the Royal Dutch Air Force, the Royal Dutch Navy and the Royal Dutch Army. Underlying this case study the following research question has been formulated:

“How can potential added value of cooperation in a network be effectuated to benefit the own internal organisation?” Colonel Kaelen, 2007 (PPP project officer at LCW).

Problem Identification LCW & Scope

Several trends and contextual backgrounds have been described regarding LCW’s right to exist and its changing responsibilities and core activities defined in line with the largest reorganisation in the history of the Dutch Military, as stated inherently to and triggered by the end of the ‘Cold War’, the Dutch participation within the NATO and the formation of the European Union. This also described the fact why LCW became aspired to develop a ‘Centre of Excellence’ for military & civil aircraft and helicopter engine maintenance in the Netherlands. Underling this ambition, LCW stated the premise that “such an entity is needed to support future engine maintenance needs for the JSF aircraft once operational in the European theatre”. In general, this ambition has also been strengthened by a decrease in Defence budgeting in combination with the increasing importance, magnitude and complexity of Maintenance, Repair and Overhaul (MRO) services of Capital Goods available for the ‘out-of-area operations’ the Dutch Military is participating in. Considering these changing consumer demands, LCW was enforced to review its internal perspectives and configurations.

In general terms, the underlying considerations described contained two important backgrounds. First of all, the awareness of the trend that radical changes in (end) consumer demands result in new perspectives regarding the ‘entire’ product life time/cycle of Capital Goods within the Defence Industry. Secondly, the overall perspective regarding the ‘entire’ product life cycle/time, can be related to a continuous ‘Reductions in Defence Budgeting’ influenced by governmental decision making and changing ‘cost consciousness’ at top level. Combining both aspects, one overall perspective could be defined, which resulted in the following statement: ‘potential additional value can and should be obtained in order to develop a ‘Centre of Excellence’ by focusing on the entire ‘product life cycle’ costs of Capital Goods in combination with changing (end) consumer demands, rather than ‘only’ focusing on the purchasing and initial costs’. Considering the fact that these reference activities offer new opportunities for a wide diversity of capital intensive industries within the Netherlands, World Class Maintenance (WCM) is supported by the Ministry of Economic Affairs and the southern provinces of the Netherlands.

In order to overcome its changing responsibility and to benchmark, LCW became involved in several new initiatives which are still strengthened by external partners in different industrial networks. These initiatives are also said to be important due to the increasing intensity of knowledge involved and shared as required to optimize LCW’s internal business processes and overall performance. Apart from this need, these initiatives should lead to new MRO business opportunities and strengthen LCW’s ability and rights to become more market oriented and optimize its ability to adapt external trends, risks and dependencies on Macro Level.
In order to delineate the case study’s scope, the following groups of ‘long term strategic developments or directions’ at LCW have been selected in order to focus on. First of all, the establishment of a bilateral agreement defined as a Public Private Partnership Pilot between LCW and Dutch Aero Services (Das). Secondly, the set up of a ‘Key Area’ known as ‘Maintenance Valley’ defined by the Dutch Ministry of Economic Affairs in order to support regional development. Thirdly, the participation in a ‘World Class Maintenance (Consortium)’ supported by the Dutch Ministry of Economic Affairs and the Southern Provinces. This external network has been established in order to improve business processes and company performance, and to create new and more international business for Maintenance, Repair and Overhaul (MRO) Services of Capital Goods in the High Tech (Defence) Industry as directly and indirectly related to the core activities and ambition of LCW to develop a ‘Centre of Excellence’.

Although these strategic developments sounded quite opportunistic, representatives of LCW argued that these (Public-Private) initiatives do not guarantee any additional value as long as the internal organisational configuration of LCW will not be (further) optimized in order to effectively cooperate with external business partners”. Considering this argument in line with the overall trends and LCW’s requirements described, the overall research question stated above had been formulated in order to strengthen the internal perspectives at LCW. In line with these concerns, three different perspectives could be derived regarding the effectuation of potential added value through a collective form of operation:

- The first perspective relied on an internal optimization based on relatively clear objectives defined considering the functional interactions within a process chain determined according a well considered consumer demand,

- A second perspective could be defined considering relatively undefined functional dependencies and consumer needs within an external network which might result in new opportunities as well as risks.

- Although the second perspective sounded as a potential which might offer the highest opportunities, a reference had been made to the argumentation that this potential could only be obtained if the internal organisational configuration of LCW was correctly optimized. So, this meant that as long as the internal organisation is not able to increase its own efficiencies, it will not even be able to effectively cooperate with external partners and create potential business solutions towards relatively undefined functional dependencies and consumer needs. Even if particular representatives of LCW would be able to create relatively higher potentials through cooperation with external partners, the question is, whether LCW would be able to actually appropriate the potential benefits to its own internal organisation. This again relies on a well optimized internal function which referred to the first perspective stated above. Considering this mutuality, the combination of perspective one and two has been defined as a third perspective.

With respect to the ambitions of LCW defined, a focus had been made on the third perspective. This mainly required a deeper understanding of the combination of several external and internal risks and dependencies.

(*Note that: a bilateral agreement between two institutions should normally not be defined by a network perspective. This meant that the PPP Pilot between LCW and DAS should not have to be taken into account. The reason why this perspective has been rejected can be underpinned by the personal perspectives and believes regarding the relevance of a network approach.)

(**Note that these perspectives are further underpinned by scientific literature on Alliance Research. This will especially be interesting from scientific point of view. Readers who are more interesting in the practical relevance of the case study findings might skip Chapter 3.)
Research Methodology: A Case Study Approach

In order to guarantee the quality of the overall findings and recommendations given within this report, the ‘case study approach’ by Yin (2003) has been taken into account, in order to effectively guarantee the validation and reliability of this case study program.

In general, a case study approach is applied as “the preferred strategy when ‘how’ and ‘why’ questions are being posed, when the investigator has little control over events, and when the focus is on contemporary phenomenon within some real-life context” (Yin, 2003).

In line with the methodical characterization of the case study approach, the population chosen has been described while referring to LCW’s long term initiatives and ambitions described (See also above). In order to determine the quality of the empirical investigation, four test defined by Yin (2003) have been described. Firstly, considering the ‘construct validity’ (Conceptual) a list of potential sources of evidence (Yin, 2003) has been stated as applied and further discussed in order to define the actual data collection (mainly based on 16 in-depth interviews) at LCW. Secondly, the ‘internal validity’ (Causality) has been defined with special regard to the causalities and relationships among the interview questions stated with regard to the overall scope of interest summarized above. Thirdly, the descriptions and examples given according the ‘external validity’ (Domain of interest) showed that the theories or overall perspectives used to lead or strengthen this case study, are the same theories or overall perspectives, which can be used to identify the underlying core aspects of other cases to which the results are generalizable. In other words, to broaden the extent of the external validity, scientific and management literature findings of specific/comparable areas of interest (Alliance research) described**, could also be used to determine which and whether other (comparable) organisations might learn from and improve themselves through applying the lessons learned and recommendations given to LCW. Although the overall validity of a case study has been considered according the latter tests, the quality had to be considered over time as well. Therefore a fourth test described was used to determine the reliability of the data and methodologies used, with respect to the form of repetitiveness.

To further underpin and reflect the internal validity and reliability, the multiple sources of evidence used (Including 16 in-depth interviews) were integrated in convergence ways.

Underlying the final determination and justification of the analysis and decisions made (for an overview, see figure 4.3), three analytical techniques were emphasized among five major techniques stated by Yin (2003): logic modelling, pattern matching and explanation building. This reflected how the discussions and recommendations given were structured and dedicated to the comparison and overlap between the initial perspectives, internal propositions and core values of LCW, the empirical case study findings and the theoretical findings as described within the literature findings**.

General perception: Case study findings LCW

Considering an overall reflection of the former case study findings as derived after tabulating and analyzing the answers given with respect to the in-depth interviews, the following overall reflections could be derived. These perceptions are generally structured according to the combination of external and internal perspectives derived at the start. In line with this, extensions are made pursuant to the internal causality (chronological order) underlying the sub questions stated within the in-depth interviews. The final recommendations given correspond with this causality as well. A probability exists that the dependencies and risks might occur in the same order.

External Perceptions: Dependencies and Risks

Although the focus of this case study is mainly related to the internal perspectives of LCW in order to define how potential added value of cooperation in a network should be effectuated, several external risks and dependencies were defined considering the overall mutuality between the external and internal perspectives at LCW. In general the following external aspects were defined as critical
towards internal processing and decision making. First of all, a collective form of interest has been defined in relation to ‘unequal value appropriation’ between partners within a network. Followed by a large complexity and restrictions mentioned with regard to OEM licensing and National/International governmental decision making. Apart from this ‘a strategic loss of information or core competences’ due to mismanagement at operational level within an internal organisation has been defined as well.

**Internal Perceptions: Dependencies and Risks**

**Lack of organisational structure to enhance creativity**

The former organisational structure at LCW, has been defined as a ‘splendid isolation’ (definition, see Top Document LCW, Concept 2007) or rigidly ‘old fashioned’ hierarchical system or structure, which is limited or closed by former organisational and social boundaries or dependencies as stated by top management. In line with this, several managers are not aware of the fact how ‘former organisational settings and boundaries’ limit and disrupt new project initiatives, creations and process improvements as being available outside and within the current organisational setting. Therefore the suggestion might be given that managers should be aware of the structural differences between network configurations within and outside an internal organisation.

**Social and Cultural Dependencies**

The organisational and social boundaries or dependencies have been related to the organisational culture and human interaction. Issues as: organisational commitment, trust, fear and willingness among individuals and groups towards new or external initiatives, have been defined as the core problems in order to apply particular initiatives at LCW. Differences between governmental (public), military, and private institutional cultures have been mentioned to enforce this social or cultural impact as well. Considering this, ‘social resistance’ can be defined as an overall problem towards the implementation or adaption of particular risks and opportunities stated in line with the effectuation of potential added value of cooperation in a network.

**Lack of Accommodation and Capability**

Certain lacks of accommodation have been defined with respect to the availability of space, tools and resources needed overtime in order to successfully facilitate and operate particular collaborations. The availability of well ‘qualified employees’ (especially technicians) has said to be a core problem as well. In line with this several representatives referred to the current developments in order to establish an ‘in house learning facility’, in order to overcome this lack of resource.

**Lack of Performance Measuring**

The organisational hierarchy, as controlled by governmental decision making and authorization from top management, conflicts with performance measuring systems ideal to creativity and process improvements of lower organisational levels. For example, unobvious results exist regarding ‘the reappearance of former mutual risks and business opportunities among a broad diversity of organisational processes, e.g. the lack of visibility in ‘profit and loss accounts’ limits the creation for new business opportunities.

**Feedback and Utilization of Performance Outcomes**

A need for relatively more feedback between and among representatives from different levels of operation (departments) can be identified, in order to utilize the results and outcomes of organisational performance as measured within the entire organisational system.
Discussion and conclusions: Combining External and Internal Perspectives

After reflecting the former topics described above in order to develop several overall perspectives, the following arguments could be stated: ‘according the functional or complementary needs within and outside the organisational networks of LCW, an alternative management approach needs to be adapted within the current ‘hierarchical setting’ within LCW in order to stimulate creativity needed to manage potential risks and business opportunities’. This management approach should be used to focus on the mutuality or interaction between the external and internal risks and opportunities. Considering the selection and implementation of an alternative management approach, the organisational system or structure requires a ‘structural hole network’, which exists of a closed system, consisting of open (sub) components (holes/gaps) which should be (re) defined as functional or complementary potentials to the overall system itself. For instance, the entire organisational building should be closed to protect its internal settings, but particular departments within this building should be left open, visible and ordered according to a transparent setting, in order to be recognized and understood by all participants who might share potential added value. Considering the protection of other functional components within the organisational system, ‘bridge’ functions (e.g. window approach) should be created between these internal ‘holes/gaps’ and the external environment of the overall system. In order to balance between these open and closed forms of interaction, one internal management approach (open organisational learning) is required to manage and qualify the social and cultural dependencies underlying the (cap) abilities needed and to full fill a structural hole in order to effectuate potential added value of cooperation in this network. Additionally, a long term (strategic) perspective or vision should be considered to predict relatively undefined functional dependencies and consumer needs within and outside an external network or industry. This, for instance, involves the question, how potential alliance opportunities will occur due to the fact that partners are via-via (indirectly) informed of other partners’ reputations embedded in or outside their former network boundaries. Examples were given considering the economical profits of the JSF program in terms of spin-offs and spill-over effects an actor in an industrial network might realize. Considering the potential business opportunities for other industries or markets, this again reflected the importance of the fact that the Dutch Ministry of Economic Affairs has been involved in the current developments at LCW.

In abstract terms, the following could be concluded:

- First of all, one management approach should be applied in order to re-structure a former rigidly ‘old fashioned’ hierarchical system within the internal organisation, since this is currently limiting and disrupting organisational creativity, needed to benefit the internal organisation and LCW’s ambition to develop a ‘Centre of Excellence’ for military & civil aircraft and helicopter engine maintenance in the Netherlands. In line with this, openness, transparency and visibility are suggested as the core aspects in order to create and implement new product and/or process improvements as gathered outside the former configuration.

- Secondly, this management approach should facilitate the ability to adapt external dependencies and risks. In line with this it is still important to protect, keep and close particular formations as stated in line with long term strategic directions of the overall Ministry of Defence.

- Thirdly (additionally), a long term (strategic) perspective or vision should be considered to predict relatively undefined functional dependencies and consumer needs within and outside an external network or industry.

Combining these conclusions, one management approach should be applied with respect to an open as well as closed form of interaction, within and outside the organisational configuration. In line with this, managers should be able to benefit from, reject and control new or former limitations of human interaction and social or cultural dependency as formed underlying one overall management approach.
Recommendations to LCW

The following recommendations were stated in order to effectuate potential added value of cooperation in a network as needed to benefit the own internal organisation of LCW. These recommendations are described according to the internal causality underlying the overall problems and transitions described and should therefore be especially (‘re’-) effectuated pursuant to the internal dependencies and risks as inherently ordered with respect to the general perceptions and reflections stated. As mentioned earlier on these recommendations are strengthened by the literature findings in Alliance Research**.

Considering more concrete descriptions and examples of the following recommendations, managers should particularly focus on Chapter 7.

1) Integrate ‘Structural ‘Hole’ Networks’ and supporting ‘Open Organisational Learning’ to enhance Creativity and Innovation.

In general terms, ‘Open organisational learning’ should be supported among different levels within or outside a ‘structural hole network’ in order to effectuate potential added value, needed to (re)-fill the functional or complementary ‘holes’ as defined according to the organisational needs and objectives in the overall system. The position and additional value of former employees and their interactions within and outside a current organisational setting should therefore be reconsidered as well. In line with this, managers should be aware of another’s dependencies, needs, willingness, fears and (cap)abilities to (co)operate with internal as well as external representatives.

How opportunistic or tactful these topics might sound, managers should really take action and communicate these thoughts among the entire (own) organisation(s). Although this sounds quite ‘simple’, the case study findings as well as the literature findings in Alliance Research (Chapter 3) show that there is still a common lack in knowledge management. Considering this, the following recommendation is dedicated to the question how managers should become more capable and learn to take more responsibility in relatively new forms of cooperation, how they should support and share their and someone’s others ideas and experience in order to successfully accommodate or effectuate new alternatives and creativity among different organisational levels.

2) Become (cap) able to Support and Accommodate Creativity and Leadership through Open Communication, Visibility and Responsibility Taking towards Internal and External (Mutual) Initiatives.

In order to stimulate the effectuation of the first group of recommendations among the entire organisation or its (sub) departments, the following is recommended: ‘Open communication and visibility’ and ‘responsibility taking’ should be supported, among individuals in order to share and adapt external initiatives needed, to become aware of the cultural and social backgrounds underlying another’s reasoning to (co)operate. In line with this, individual employees or groups should be enhanced to ‘unlearn or reject former incompatible configurations’. This means again that former organisational/departmental boundaries, limitations, restrictions should be removed or extended in order to accommodate external initiatives. For instance, departments or internal workspaces should be ‘simply’ cleaned or tidied up to create open areas, free space or accommodation necessary to become visible and transparent.

Re-considering the human interaction underling the former recommendations, a lot of concerns with regard to ‘social resistance’ could be identified apart from and inherently related to the fact whether knowledge, expertise or compatible tools and materials are already available and up to date, shared and adapted among the most effective organisational structures or underlying configurations. In line with these concerns, the following recommendation is stated according the problem how the underlying norms and values as embedded in the organisational culture might somehow be changed.
3) Apply Cross Functional Utilization and Exchange among Different Departments and Institutes to Reduce ‘Social Resistance’ while measuring performance and enhancing Creativity or Knowledge sharing among Internal and External Key Persons.

‘Social resistance’ should not only be considered with respect to the former routine processes as stated in line with the hierarchical setting of a military organisation, but also in relation to the process initiatives and partnerships stated to improve these routine processes and to create, develop and successfully integrate new alternatives as initiated within or outside the current organisational settings/boundaries. Therefore, ‘social resistance’ against personal feedback and performance measuring of individuals and groups should be determined and eliminated. Cross functional utilization or exchange will be highly relevant to identify and support the considerations embedded within this feedback overtime. For example, informal interactions, meetings or platforms based on a broad diversity of functional or complementary inputs as gathered from different levels of (co) operation are recommended in order to stimulate individuals to create and apply new initiatives. These inputs can be gathered trough so called ‘gate keepers’, ‘key persons’, or ‘Glo-cals’ selected through formal or informal interactions according to their competences to focus on two sides. First of all, they should be able to identify structural holes or components within an internal system. Secondly, they should be able to continuously scan external environments, search for, pull and estimate potential added value among cooperating entities in order to fill structural holes or components defined within the internal system. The informal selection of ‘key figures’ might occur outside a former configuration, for example unknown competences of individuals might become visible through participation within the following forms of operation: Public, Private, Knowledge Institutes and Non Governmental or Non profit organisations (NGO/NPO).

After applying the former recommendations given, managers should re-consider the fact whether the alternatives were effective enough in relation to the overall performance required in line with the transitions and partnerships defined. How opportunistic and important the initiatives required will be, managers should be aware of the fact that certain risks might re-occur over and over again. Considering the concrete examples given in Chapter 7, the following recommendation is defined in order to stimulate a continuous process of change.

4) Re-consider Performance Outcomes, Equal Profit Sharing and Rejecting / replacing new incompatibles.

The former recommendations should be (‘re’-) effectuated over time. Be aware that the influence or performance outcomes will not always be directly visible. In this circumstance, patience is strongly recommended, but will be enhanced through mutual understanding and openness as well. In this sense, implementers should (‘re’-) consider and (‘re’-) act towards new objectives and subjectivities over time as stated in line with an entire product life cycle or potential business opportunities or threats. Therefore the participants should reconsider performance outcomes according to the functional and complementary needs as defined among different structural ‘holes’/’gaps’ and levels of cooperation, within and outside a former organisational configuration, in order to be able to re-act on potential risks and business opportunities as embedded in potential added value of cooperation in a network. In line with this, functional punishment and reward systems should be developed and implemented with respect to performance measuring and to enhance individuals or groups to create, share and implement new initiatives which benefit the internal organisation in the right direction. In line with this, managers should offer equal bargains and share potential benefits in order to overcome internal rivalry between collaborating entities.
5) Consider Mutual Ambidexterity: Orchestrate with a long term vision! But don’t forget to manage and (re-)act today!

Considering all recommendations and directions given above, several process steps should be realized and implemented. Although particular recommendations sounded quite opportunistic, simple and recognizable but still have not been applied correctly cause of ‘social resistance’, a certain twofold / mutuality should be re-emphasized in general. Managers should really understand the overall difference between the ‘fixed’ attitude required according former and current routines or processes within the internal organisation defined and integrated in the hierarchical (military) setting and the parallel attitude required in order to be(come) ‘open minded and creative’ to continuously be able to collaborate, change and adapt the external risks and opportunities (for further (dis)integration of current/potential: suppliers, organisational configurations, customers and (end) consumers demands) on Macro and Meso level based on market mechanisms. Considering this mix or mutuality a ‘structural hole network’ based on the combination of fixed/closed configurations and open settings should be orchestrated by LCW rather than an external institute or broker who tries to do the same, in order to overcome external dependencies and to strengthen the strategic directions in the future. Therefore, the PPP Pilot between LCW and DAS should not be seen as a bilateral agreement, but as a network perspective which is carefully orchestrated by LCW itself. In line with this, the recommendations stated pursuant to an internal perspective should be extended with respect to the external network perspectives as well.

Considering the latter to a larger extent, participants should realize and consider the relevancy of particular improvements and innovative technologies/solutions for others within or outside a current industrial network. The potentials underlying the technical spin offs and spill-over which might occur, reflected again the reason why representatives of the Ministry of Economic Affairs should be involved as well.

Additionally) Restrict and Apply Further Research at LCW.

Although this report contained several suggestions according further research which might be relevant, especially from scientific point of view, managers at LCW should consider the costs and time involved and should really be aware that people should not hide themselves behind the fact that following up research is still in process.

Closing remark

Regarding the overall topics studied and described according this case study, the recommendations stated above were defined corresponding the question how potential added value of cooperation in a network can be effectuated to benefit the own internal organisation of LCW. This question was formulated corresponding the need to get new insights and perspectives on inter firm cooperation/initiatives between Public and/or Private Partners in an industrial network and how this affects the internal organisation of LCW. These insights and perspectives were required due to several major transitions and trends in the Dutch Military / European Defence Industry as caused by former decisions made on International/ governmental Level in a period defined after the ‘Cold War’.

Hopefully the descriptions and recommendations given within this report gave positive insights and perspectives to be successfully integrated and implemented within the entire Organisation to strengthen the underlying and current transitions, the organisational structure, overall activities related to inter firm cooperation, social and cultural attitudes and off course the entire overall performance and ambition to develop a ‘Centre of Excellence’ for military & civil aircraft and helicopter engine maintenance in the Netherlands. Hopefully these insights also encourage participants to develop, share and implement a broader vision regarding potential technologies, product and process improvements/innovations related to the spin offs and spill over effects mentioned according the High Tech Technologies involved in the Dutch Defence and MRO Industry.
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1 Introduction Case Study LCW

This report is part of a Master Thesis Program in ‘Innovation Management’, at Eindhoven University of Technology (The Netherlands), Department of Industrial Engineering & Innovation Sciences, Division Innovation, Technology Entrepreneurship & Marketing (ITEM). During this Master Thesis program, a case study with respect to network cooperation had been executed in order to give recommendations to Logistic Centre Woensdrecht (LCW). LCW is the military logistic centre in the Netherlands, that ensures the availability of air-based and other weapon systems and ground based communication systems for carrying out operational tasks. LCW is part of the Defence Materiel Organisation (DMO) in the Netherlands, which is related to the Royal Dutch Air Force, the Royal Dutch Navy and the Royal Dutch Army. Underlying this case study the following research question has been formulated:

“How can potential added value of cooperation in a network be effectuated to benefit the own internal organisation?” Colonel Kaelen, 2007 (PPP project officer at LCW).

This case, focusing on inter firm forms of co-operation, internal organisational aspects and networks, is especially interesting cause of the underlying backgrounds, trends and extension, the underlying diversity and intensity of high technologies and knowledge involved, the social and cultural backgrounds, perspectives and complexities based on a wide diversity of different representatives of different nations/(inter) nationalities, industrial sectors and professions. Furthermore this case study is especially relevant from scientific perspective since it both reflects Public as well as Private forms of Partnerships. This due to a lack of scientific literature published regarding Public / and Public-Private forms of inter firm co-operation.

The overall research question has been stated according several in-house concerns and (internal and external) perspectives defined in line with several major transitions and trends which took place in the latter decades as defined in Chapter 2. Overall findings are indicated regarding the nature and impact of the overall transitions and trends which affected LCW’s right to exist and triggered the ambition of LCW to develop a ‘Centre of Excellence’ for military & civil aircraft and helicopter engine maintenance in the Netherlands needed to support future engine maintenance needs for the JSF aircraft once operational in the European theatre. Therefore, Chapter 2 introduces the contextual backgrounds considering an overall focus on several historical trends within the Dutch and European Defence Industry. This, for instance, involves several major decisions made on European Level after the ‘Cold War’ period, which generally resulted in a ‘disintegration’ of European as well as Dutch Defence ‘efforts’ and ‘Capital Goods’ available for ‘out-of-area operations’ the Dutch Military is participating in. In line with these concerns and alternations, Chapter 2 describes how this resulted in several new initiatives or forms of cooperation which are strengthened by external (Public as well as Private) partners in different industrial networks.

To delineate the researcher’s scope, 3 major strategic developments have been selected in order to focus on: a Public Private Partnership (PPP) Pilot between LCW and DAS, a redesign known as ‘Maintenance Valley’ (MV) and World Class Maintenance (Consortium) WCM(C). These long term initiatives described in respectively subparagraph 2.4.2-2.4.4 can be seen as relatively new bilateral and multilateral collaborations or networks between LCW and external partners (Public and Private), initiated to create and appropriated potential added value with regard to Maintenance Repair and Overall (MRO) services of Capital Goods in the High Tech (Defence) Industry as directly and indirectly related to the core activities and ambition of LCW to develop a ‘Centre of Excellence’. 
The historical trends and contextual backgrounds stated within Chapter 2 can be seen as side issues in relation to the overall question of this case study, but they are relevant to determine the uniqueness and complexity of the case LCW is involved in. This is important to identify the relevancy of former (Scientific and Management) literature used in order to benchmark and strengthen the external validity of the case study findings and recommendations given within this report. Therefore Chapter 3 contains a literature review based on ‘Alliance literature’ selected to define inter firm cooperation. Three relevant levels of analysis similar to the required or underlying fields of interest integrated within the overall research question have been described (see figure 3.1) respectively based on, a dyadic perspective, the firm level and the network level. Before these levels of alliance research are discussed in greater detail, paragraph 3.1 shows a certain similarity between: the underlying formations, causalities and trends in the Dutch Military as defined in Chapter 2 in relation to LCW, and a comparable transition in other industries (emerging paradigm of Organisation) which took place in the course of the 1980s as described within alliance research literature. This also involves the question, why and how alliances literature has increased within the last decades, including several different definitions and forms of an (strategic) alliance.

In order to guarantee the quality of the overall findings and recommendations given within this report Chapter 4 describes the determination of the methodologies chosen according the overall research project. This involves the definition and methodical characterization (applicability) of the case study approach by Yin (2003) (see paragraph 4.2), determined according the underlying nature of overall research question stated as defined in Chapter 2. In line with the methodical characterization of the case study approach, paragraph 4.3 defines the population chosen which referred to the long term initiatives as described in Chapter 2. In order to determine the quality of the empirical investigation, four tests defined by Yin (2003) have been described in paragraph 4.4, respectively the “construct-, internal- and external validity and reliability”. Furthermore, Chapter 4 is also used to further describe how the data has been collected, processed and examined, and how the analysis and decisions made have finally been determined and justified (see also figure 4.3).

Considering the practical insights in the empirical field of interest, Chapter 5 is used to describe the overall perceptions and findings as gathered throughout this case study. Finally, the discussions and conclusions stated in Chapter 6 and the recommendations given in Chapter 7 are structured and dedicated to the comparison and overlap between the initial perspectives, internal propositions and core values of LCW stated in Chapter 2, the empirical case study findings as defined in Chapter 5, and the theoretical findings as described within the literature review, Chapter 3.

Readers who are especially interested in the possibility to ‘generalize’ the case study findings to a larger extent, or in the suggestions made for further investigation, should pay extra attention to respectively paragraph 6.4 and 6.5.
2 Problem Identification LCW & Scope

2.1 Introduction

This chapter gives a general introduction to the contextual backgrounds of the empirical field of interest by starting with an overall focus on several historical trends within the Dutch and European Defence Industry, see paragraph 2.2. These trends affected LCW’s right to exist and triggered the ambition of LCW to develop a ‘Centre of Excellence’ for military & civil aircraft and helicopter engine maintenance in the Netherlands. Underlying this ambition, LCW stated the premise that such an entity is needed to support future engine maintenance needs for the JSF aircraft once operational in the European theatre.

In order to guarantee its right to exist and to develop a certain ‘Centre of Excellence’ on the long term, LCW is involved in several Industrial Networks. Considering this and to delineate the researcher’s scope, 3 major strategic developments have been selected in order to focus on: a Public Private Partnership (PPP) Pilot between LCW and DAS, a redesign known as ‘Maintenance Valley’ (MV) and World Class Maintenance (Consortium) WCM(C). These long term initiatives described in respectively subparagraph 2.4.2-2.4.4 can be seen as relatively new bilateral and multilateral collaborations or networks between LCW and external partners (Public and Private), initiated to create and appropriated potential added value with regard to Maintenance Repair and Overall (MRO) services of Capital Goods in the High Tech (Defence) Industry as directly and indirectly related to the core activities and ambition of LCW to develop a ‘Centre of Excellence’.

With regard to these network initiatives, one overall research question has been formulated with respect to the internal concerns at LCW (see paragraph 2.5). The overall question is how potential added value can be effectuated from cooperation in these, or other network initiatives in general, in order to benefit the own internal organisation. The internal concerns, relatively undefined, are further investigated throughout a case study (see ‘Case Study Methodology’, Chapter 4). Specific case study findings, such as mutual risks and dependencies related to particular external and internal perceptions of LCW derived from this case study are described within Chapter 5. Considering the overall performance of LCW, the focus on these risks and dependencies has been extended by focusing on internal performance measuring and the utilization of performance outcomes as related to the entire organisational alternation process. Conclusions as derived from these case study findings are further discussed within Chapter 6, followed by the recommendations given to LCW as stated in Chapter 7.

The historical trends and contextual backgrounds stated within this chapter can be seen as side issues in relation to the overall question of this case study, but they are somehow relevant to determine the uniqueness and complexity of the case LCW is involved in, which is important, to identify the relevancy of former (scientific and management) literature (see Literature Review, Chapter 3) used in order to benchmark and strengthen the external validity of the case study findings and recommendations given within this report.
2.2 Trends Defence Industry

A general perspective can be derived regarding the trends and backgrounds which affected LCW’s right to exist and ambition to develop a ‘Centre of Excellence’ for military & civil aircraft and helicopter engine maintenance in the Netherlands. This perspective resulted in the overall perception that potential additional value can and should be obtained in order to develop a ‘Centre of Excellence’ by focusing on the entire ‘product life cycle’ costs of Capital Goods in combination with changing (end) consumer demands, rather than ‘only’ focusing on the purchasing and initial costs. This perspective contains two important backgrounds: first of all, the awareness of the trend that radical changes in (end) consumer demands result in new perspectives regarding the ‘entire’ product life time/cycle of Capital Goods within the Defence Industry. Secondly, the overall perspective regarding the ‘entire’ product life cycle/time, can be related to a continuous ‘Reductions in Defence Budgeting’ influenced by governmental decision making and changing ‘cost consciousness’ at top level.

To a certain extent, these two backgrounds might be assumed as being inherent to and triggered by the end of the ‘Cold War’, the Dutch participation within the NATO and the formation of the European Union. For instance, due to a magnificent decrease in consumer demands, Defence budgeting within the Netherlands needed to purchase new Capital Goods required in line with the international overall threat and risks during the ‘Cold War’, has decreased dramatically. The reduction in Defence Budgets resulted in a ‘disintegration’ of European as well as Dutch Defence ‘efforts’ and ‘Capital Goods’ as integrated in one overall ‘autarchic’ system related to the ‘Cold War’ instrument. Apart from this, consumer demands are said to be changing in complexity and magnitude with respect to the Dutch participation in international relatively smaller, but more complex conflict situations as controlled by the NATO. Also the participation in and formation of the European Union is said to be influencing this overall consumer demand, since a higher risk in manifestations and conflicts needs to be taken into account with respect to an increasing diversity in the ‘sphere of interests’ in different regional areas as enforced by aspects as energy and water supply, relatively weak and in-complementary EU-member states, the proliferation of nuclear weapons, international criminality and terrorism. These aspects are enforced by the risks on intercontinental level, e.g. a focus on the protection of supply networks of international goods and raw materials from Asia and Africa, is said to be increasing since it forms a considerable impact of the economical requirements on European level.

Considering these trends in combination with the level of complexity of High Tech Technologies and knowledge involved, network participants or EU member states dealing with a comparable need are enforced to collaborate and come up with innovative process and product solutions which are in line with the complementary and functional requirements as derived from the integrated overall solutions stated by NATO and the European Committee. For example, through developing underlying ‘Network Enabled Capabilities’ with regard to an ‘Economy of Scale’, by focusing on the intensity of external knowledge and ‘Best Value for Money’, new concepts are said to be developed and integrated in order to obtain a higher rate of efficiency to guarantee the ‘availability’ of Capital Goods at a certain ‘Level of Service’ required due to a changing operational demands in military equipment. Underlying this, the formation of The European Defence Agency (EDA) in 2004 can be seen as an overall approach on European Level which is used to reduce this overall ‘disintegration’ through enforcing military capabilities, enabling cooperation with regard to material, technology and the Defence related industry on Macro Level. This formation resulted in the fact that a Code of Conduct on Defence procurement stated by the EDA became operational (On the first of July 2006) with the objective to balance the developing act for a ‘transparent and open’ form of cross-border competition. This code of conduct included a ‘Code of Best Practices in the Supply Chain’, which supports more transparency and enables higher opportunities for relatively smaller and small suppliers to become more competitive and be able to get access to the European Defence Market. Although this does not directly guarantee a ‘free’ market mechanism (‘level playing field’), it is said to be a ‘step forward’ and positive opportunity for the Dutch Defence Industry. This includes potential opportunities for public as well as private institutions within the Netherlands.
2.3 Defence Materiel Organisation

According the underlying trends and contextual backgrounds, needs and requirements described above, the largest reorganisation in the history of the Dutch Military has been started in 2003, in order to create a ‘new balance’ between the operational tasks and the available (capital) goods related. This new balance should guarantee a qualitative and highly valued operational military system, which is capable enough to participate in and offer the services as generally required on international grounds, as stated in line with former governmental decision making strategies and integral Defence policies. This reorganisation resulted in the fact that in January 2007, the boards of directors from Materiel and the organisations of the Royal Dutch Navy, the Royal Dutch Army and the Royal Dutch Air Force (E.g. LC-KLu Woensdrecht and Depot Rhenen) had been merged into one Organisation, known as Defence Materiel Organisation (DMO). DMO became an element of the Defence Organisation, where a large number of civilian employees work alongside military personnel, from the navy, army and air force, to ensure the availability of virtually all Defence material. The majority of the materiel logistic activities within the Defence Organisation are said to be carried out by DMO in order to guarantee the fact that the operational commands can concentrate fully on their core business, in the knowledge that DMO provides them a high value materiel support. DMO became responsible for materiel logistics policy, new material, maintaining materiel and divestment of surplus materiel. Considering the latter in relation to the Royal Dutch Air force, a ‘disinvestment of surplus material’, can for example be seen in a numerous reduction of 29 out of 137 F16 Aircrafts, in combination with the closure of one out of three former Air Force Bases specialized in the F16 Aircraft. On the other hand the responsibility for new materiel can for example be described by the current preparations for the overall replacement of the F16 by for example the JSF Aircraft.

Both examples stimulate the overall integration of the underlying processes and products used to maintain these Capital Goods on a relatively long(er) time span. Considering the underlying logistics, processes and products related to the ‘availability’ of these air based systems as required on international grounds, the overall focus of DMO is said to be changing towards one integral approach which leads to an increased focus on Maintenance, Repair and Overall (MRO) services of Capital Goods.

2.4 Logistic Centre Woensdrecht

According to the increased focus on the MRO activities of Capital Goods defined above, Logistic Centre - Royal Dutch air force (Logistiek Centrum Koninklijke Luchtmacht, (LC-KLu)) located at AFB Woensdrecht and Rhenen had been merged with the Centre Technology and Mission Support Dongen (Centrum voor Technologie en Missieondersteuning (CTM)) into one Organisation known as Logistic Centre Woensdrecht (LCW-DMO). Underlying this formation, LC-KLu has been selected cause of the following propositions:

- Full range of higher maintenance activities
- In-depth modification expertise
  - Early F-16 user (and hence ‘ahead of the game’ in modifications)
  - Strong engineering capability – co-setting standards for modification configuration
- In-house calibration expertise
- Excellent relationship with Original Equipment Manufacturers and USAF
- Back-up capacity for Out Of Area operations
- Provider of F100 engine overhaul services (F16-Engine)

- Colonel Kaelen, PPP Project Officer, 14 December 2006

1 (At the start of this project, the JSF aircraft was defined as a valuable option in order to replace the current fighter of the RNLAF, the F16. The product life time of this fighter will end approximately around 2010 and is therefore one of the main reasons that the Netherlands are involved in the JSF Program. The facets of the JSF are summarized in “Introductiedossier bewindslieden EZ, 2007” as published by the Ministry of Economic Affairs in the Netherlands. See Appendix).
To strengthen the position of LCW, the maintenance services and activities located at Rhenen and Dongen are said to be moving and re-located at LCW. This resulted in the fact that LCW became the military Logistic Centre in the Netherlands, which ensures the availability of air-based and other weapon systems and ground based communication systems for carrying out operational tasks. According this responsibility, LCW became aspired to develop a ‘Centre of Excellence’ for military & civil aircraft and helicopter engine maintenance in the Netherlands. Currently, the following core activities can be identified at LCW: (Colonel Kaelen, PPP Project Officer, 14 December 2006)

- *Higher Level maintenance: inspection, repair, overhaul and modification of air based (weapon) systems and components*
- *Integrated logistic support*
- *Inventory management (fore casting & stock control and procurement)*
- *Storage and distribution of materiel*
- *Aircraft salvage*

Considering these core activities in relation to the trends and former propositions of LC-KLu, LCW became responsible for a higher diversity in and relatively more types of air based (weapon) systems which require Higher Level Maintenance services as stated in line with the changing consumer demands described above. Apart from these changing responsibilities and overall ambition, LCW was also enforced to: reduce its number of employees, review its internal perspectives and reduce its annual budgets.

2.4.1 Internal propositions and Sub Conditions LCW

Considering its internal requirements and dependencies, LCW stated several core values which have to be used as the underlying propositions and sub conditions, in order to determine several major perspectives needed to direct the case study’s scope.

Core values LCW

In line with the reorganisation of 2007, LCW is introducing a management model stated by DMO. This resulted in a structural separation of the following underlying departments: Staff, Account Management, Technology, and Logistics. This formation is stated according the responsibility to offer a ‘one-stop service’ to its customers. LCW integrated this DMO management model into one univocal approach, which enables the effectuation of potential opportunities to create effective subsystems and process efficiencies needed in order to guarantee the availability of air based weapon systems (Capital Goods) at a certain ‘Level of Service’ required in line with a changing operational demand in military equipment. Considering the overall need to successfully implement this business model, LCW started to change its internal perspectives and core values. For example, ‘Information centres or contact points’ for different stakeholders (e.g. customers and employees from different locations) are said to be changing. Considering the assumption that this overall change is liable on the human interaction between representatives from different backgrounds, a focus is still said to be required on the diversity in social, cultural and demographical aspects as related to the overall integration processes within LCW. In line with this internal perspective, a focus on the communicative skills of individuals and groups is said to be required to influence organisational behaviour and human attitudes. Underlying these concerns, LCW stated the following four core values with special regard to the cultural changes required:

- **Professionalism**: knowledge intensity and expertise to be expressed in professional attitude for customer and colleague.
- **Customer orientation**: recognition of (internal as well as external) customers’ desire, need and interest, to be expressed in customer oriented solutions and internal process integration.
- **Openness**: open-minded for ideas and criticism from all levels of participations, continues endeavour for improvement, recognition for and converting opportunities into innovative process activities while increasing the performance outcome of LCW.

- **Partnership**: collaborative outcomes (even when LCW’s own interest is not directly served) and transparency to obviously demonstrate these collaborative outcomes.

In order to obtain these core values, Staff LCW is not determining technical opportunities and product specifications on behalf of top-level anymore. Although the Organisation is still structured by top-level, several areas are required to be opened and full-filled by individual decision making depending on the changing customer demands on specific moments in time. LCW is said to be changing from a ‘splendid isolation’ approach controlled by top level into an ‘open approach’ with increasing transparency of its operational decision making processes. Due to this change, responsibilities from top level are passed on to the employees. Not only the members on top level but all employees are required to become more responsible for the overall performance. In line with this, the organisational structure is still required to be optimized to continuously effectuate potential opportunities and to overcome the responsibilities as derived from external customer demands and cooperation within external networks. Instead of ‘managing from different disciplines’ (Quality, Cost, etc.), ‘one integrated business process’ is said to be required in order to enhance the responsibility of all employees. In line with these needs, LCW is said to require a better perception on: the effectuation of potential added value and value chain management, based on a process view within an Organisation.

Considering the former trends and backgrounds in combination with these internal perspectives, several new initiatives strengthened by external partners among different industrial networks have been established in order to overcome the entire reorganisations and ambition. These initiatives are described within the following paragraphs.

### 2.4.2 Public Private Partnership Pilot: LCW and Dutch Aero Services

To overcome the internal requirements and obtain the overall ambition to develop a ‘Centre of Excellence’, LCW is increasing its attitude to effectively cooperate with industrial (public as well as private) partners among different networks focusing on MRO services of Capital Goods. Although these forms of cooperation sound opportunistic, several risks and dependencies are required to be identified. For instance, LCW is not allowed to ‘completely’ outsource all the MRO activities, since this might negatively affect the ‘out-of-area operations’, the overall ambition of the Dutch Military to become a ‘smart buyer/smart maintainer’ and it might led to the overall risk to create a monopoly position. Considering these concerns and opportunities in combination with the internal process requirements and cost reductions, LCW gave preference to the formation of Public Private Partnerships in order to become more market oriented and be able to acquire new orders from third parties. This resulted in the formation of a PPP Pilot between LCW and Dutch Aero Services. This formation is said to be unique, since this is the first time that the Dutch Ministry of Defence collaborates through a public private partnership based on a ‘growth-model’\(^2\). In line with the opportunity to acquire new orders by collaborating with a third private partner, a business process redesign method will be implemented to renew and restructure particular MRO processes of Capital Goods located at LCW. Apart from the focus on the MRO activities of former Capital Goods, this pilot project is said to be used to demonstrate the in-house capabilities of LCW in Engine MRO to acquire maintenance orders of the JSF military aircraft engine for the (near) future.

Considering the underlying potentials of the Dutch Defence Industry, the Dutch Ministry of Economic Affairs is said to be highly involved as well, in order to stimulate economical growth with regard to the potential business opportunities derived from innovative solutions. Several network initiatives are said to be enhanced to strengthen the international exploitation of spin-offs and technologies created

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\(^2\) (In this sense, a ‘growth model’ refers to the vision and assumptions that relatively new initiatives, complementary resources and innovative technologies will not only be used to achieve a higher prospective value, but that unforeseeable opportunities will arise due to a continuous increase or accumulation of former successes and innovations over time.)
within the Dutch Defence- and MRO Industry. Regarding to the additional function and value these networks might offer, LCW is involved in a complete redesign known as ‘Maintenance Valley’ (MV) as defined within the following paragraph.

2.4.3 Maintenance Valley

LCW can be seen as the ‘Key Player’ in a complete redesign known as ‘Maintenance Valley’ (MV), which is aimed to improve business processes and company performance (in terms of cost levels, availability and integrity) as well as creating more new international business for MRO industries. This redesign is based on strategic cooperation of large and small (Public as well as private) MRO players which provides value driven and innovative MRO services in Capital Goods.

MV is part of the ‘Key Area: High-tech systems and materials’ of the ‘Innovation Platform’, which is an initiative of the Dutch government. This key area, together with several others, was published by Tilburg and Bekkers (2004) in a policy document known as “Voorstellen Sleutelgebieden-aanpak”. In this document, several concrete ideas were presented in order to focus on the collaboration between: governmental institutions, knowledge institutes and industry in potential industrial areas in the Netherlands. In line with this focus, MV has been specified as a high valued initiative based on the assumption that MRO should be seen as a strategic competence on national level which might offer an increasable amount of potential added value in the future. The overall concept contains two major fields of interest based on the distinction between Military and Civil MRO Markets, which resulted in respectively a military and a civil component. This military component has been located and centralized at LCW, due to the underlying trends, opportunities and ambitions defined in the previous paragraphs. The ambition to develop MV, started with a core focus on the Aerospace Industry followed by a growing participation of other capital intensive industries.

To strengthen the potential opportunities of MV, it became necessary to create new business environments in which the key players (E.g. LCW) of specific areas would be able to find each other, to show each other’s ambitions, to bundle their strengths and to find the willingness to reach collectives goals. According this necessity, the following text describes the objectives and activities of a World Class Maintenance initiative, LCW is participating in.

2.4.4 World Class Maintenance

In 2007, a World Class Maintenance (WCM) initiative became operational and resulted in the creation of a cross-functional maintenance platform of industrial partners aimed to develop the South of the Netherlands as pilot region where high-end MRO knowledge and skills are being developed, shared and employed at a World Class level. This WCM initiative can be seen as a ‘connecting act’ or network of the capital intensive industries: Aerospace, Maritime, Infra, Process and Energy. Within this WCM initiative, partners from public as well as private institutes are brought together considering their overall focus and interest in the field of MRO and their potential to create a competitive edge to secure and create sustainable jobs and businesses. In comparison with the needs and requirements underlying LCW’s ambition to develop a ‘Centre of Excellence’, this World Class Maintenance initiative forms an important potential and opportunity for ‘Asset Owners and Asset Operators’ similar to LCW to:

- “Improve Asset Performance of the existing production facilities and plants in terms of: Overall Equipment Effectiveness of the processes, leading to a competitive edge on a global scale. Challenge the ‘best in class’ benchmarks for international (plant) performance”.

- “Improve Asset Performance in terms of improved Life Cycle Costs, optimize Maintenance Costs and enable cost price to be reduced and sustainable profit to be improved”. ( www.worldclassmaintenance.eu , 2009)
The former objectives are stated in line with the overall perception, that the industrial partners involved start to recognize the premise that the maintenance costs of an ‘Entire Life Cycle’ are often higher than the purchasing and initial costs of the Capital Goods. Similar to the current developments at LCW, these companies start to realize the fact that this changing ‘cost consciousness’ might lead to new business opportunities by focusing on the potential added value obtained through an increased ‘availability’ of the Capital Goods among their current assets. In line with these business opportunities, this WCM initiative is also aimed to:

- “Attract more new MRO business to the southern region and to the Netherlands in general. Create both geographic and virtual MRO supply chains and hot spots that beat the competition on a global scale”

- “Expand the export activities for Dutch based Maintenance, Repair and Overhaul companies, including the Original Equipment Manufacturer activities with strong MRO business drivers”. (www.worldclassmaintenance.eu, 2009)

Underlying the overall potentials on the long term, WCM is structured by four reference activities. The first reference activity resulted in the formation of a World Class Maintenance Consortium (WCMC) aimed to improve the asset performance and life cycle costs of installed base in the Netherlands and to ensure that the Dutch turnover in global maintenance activities increases (export) and promoting international growth of MRO business executed in the Netherlands (import). This WCM Consortium creates new business propositions by developing new strategies, joint project execution, new products and processes. Additionally, a business driven research program is said to be constructed together with several Universities. WCMC’s aim is to help to create a competitive support environment in the Netherlands for production plants and operators, with sustainable business and employment growth. The second reference activity of WCM resulted in the formation of a Maintenance Competence Centre (MCC). This MCC is defined as a centre where MRO expertise and best practices will be shared, trained and employed between Asset Owners, Asset Maintainers and Asset Manufacturers including SME companies and with strong connections to educational institutes. Considering the intensity of knowledge and reducing number of maintenance technicians on the long term, a third reference activity has been stated, which is known as a Maintenance Education Consortium (MEC). This consortium is a platform which consists of several institutes and schools which have joined their forces to focus on World Class Maintenance programs for future (maintenance) technicians. The fourth reference activity of WCM resulted in the development of designated business parks to host Maintenance, Repair and Overhaul services as well as Logistics businesses to support local, regional, national and global customers. An example of a designated business park can be given by the formation of ‘Aviation Park Aviolanda’. This business park is part of MV (see subparagraph 2.4.3) and will be centralized around Fokker Services (Stork Aerospace) located near AFB Woensdrecht. Aviation Park Aviolanda is aimed to centralize (Public as well as private) organisations depending on the Aerospace Industry and related services.

These references activities are said to be important for LCW, considering the mutual interests of all partners to focus on potential business opportunities and innovative solutions and technologies within the overall MRO Industry. This need is strengthened by the increasing intensity of knowledge shared within these networks as required in order to optimize the own internal business processes within LCW.

Considering the fact that these reference activities offer new opportunities for a wide diversity of capital intensive industries within the Netherlands, WCM is supported by the Ministry of Economic Affairs and the southern provinces of the Netherlands. As mentioned before with respect to the participation of the Dutch Defence Industry, within the overlying innovation processes at LCW, the Ministry of Economic Affairs is said to be highly involved within these networks initiatives, in order to stimulate the underlying innovation processes and to strengthen the international opportunities in the exploitation of spin-offs and technologies created within the Dutch Defence- and MRO Industry.
2.5 Scope: Research Question LCW

The former paragraphs described several trends and contextual backgrounds which affect LCW’s right to exist in combination with its changing responsibilities and core activities stated in line with the largest reorganisation in the history of the Dutch Military. Considering LCW’s changing responsibilities and core activities, LCW became aspired to develop a ‘Centre of Excellence’ for military & civil aircraft and helicopter engine maintenance in the Netherlands. Underlying this ambition, LCW stated the premise that such an entity is needed to support future engine maintenance needs for the JSF aircraft once operational in the European theatre. In general, this ambition has also been strengthened by a decrease in Defence budgeting in combination with the increasing importance, magnitude and complexity of MRO services of Capital Goods available for the ‘out-of-area operations’ the Dutch Military is participating in. Considering these changing consumer demands LCW was enforced to review its internal perspectives and configurations. In order to continuously adapt this responsibility and to benchmark, LCW became involved in several new initiatives strengthened by external partners in different industrial networks. These initiatives are said to be important due to the increasing intensity of knowledge involved and shared as required to optimize LCW’s internal business processes and overall performance. Apart from this need, these initiatives should lead to new MRO business opportunities and strengthen LCW’s ability and rights to become more market oriented and optimize its ability to adapt external trends, risks and dependencies on Macro Level. Although initiatives based on network cooperation, sound quite opportunistic and might indeed lead to new possibilities, benchmarks and potential business solutions required to enforce LCW’s changing core activities and ambition to develop a ‘Centre of Excellence’, representatives argued that these (Public-Private) initiatives do not guarantee any additional value as long as the internal/organisational configuration will not be (further) optimized in order to effectively cooperate with external business partners. Considering this argument in line with the overall trends and LCW’s requirements described within this chapter, the following research question has been stated in order to strengthen the internal perspectives within LCW:

“How can potential added value of cooperation in a network be effectuated to benefit the own internal organisation?” Colonel Kaelen, 2007 (PPP project officer at LCW).

Considering this research question with respect to several external (network) initiatives LCW is participating in, in combination with the concerns (paragraph 2.4) based on LCW’s core values stated in order to influence organisational behaviour and human interaction to overcome a cultural integration process after its reorganisation, three different perspectives can be derived regarding the effectuation of potential added value by focussing on a collective form of operation (between Public and Private partners):

- The first perspective relies on an internal optimization based on relatively clear objectives defined considering the functional interactions within a process chain determined according a well considered consumer demand,

- A second perspective can be defined considering relatively undefined functional dependencies and consumer needs within an external network which might result in new opportunities as well as risks.

- A third perspective consists of the mutuality or reciprocity regarding the effectuation of both perspectives.

These perspectives are visualized within figure 2.1.A-C.
Figure 2.1.A: Different perspectives on collective forms of intra- and inter firm operation.

Figure 2.1.B: A further focus on the mutuality and interface between different partners.
According perspective 1, several insights are visualized regarding the internal configuration of an organisation. For instance, figure 2.1.A shows the internal ‘value chain of company 1’ (Blue coloured) as defined in relation to former or current consumer demands and needs. In general terms, these consumer demands are based on the entire life cycle of a product or services required according a particular time span (e.g. P1). Underlying this value chain, several examples of the underlying (sub) process chains/inputs are visualized as well (Blue coloured also). Among these sub processes, an extra component has been drawn as an example of ‘internal optimization’ of an underlying process (between step 3 and 4). This component is meant to show the differences between a ‘chaotic’ and a well ‘streamed’ process. In a logical sense, the assumption might be made that internal representatives/managers are able to optimize certain ‘chaotic’ processes by them self. This should especially be possible when functional needs and demands are clearly defined.

Although the latter sounds quite opportunistic, it will be a challenge when participants are not able to adapt these kind of problems (e.g. due to overestimation). Another challenge can be defined if managers want to optimize a former (sub) process through tighter/further integration of particular stakeholders (e.g. specific suppliers of raw materials). This problem even becomes a higher challenge if functional needs and demands of a consumer are changing in complexity overtime (See figure 2.1.A, e.g. considering the entire life cycle in P1, a ‘blue part’ is required, while the transition period t1 and the entire life cycle in P2 show a changing need for a ‘green part’). Considering these challenges with regard to the definition of perspective 2, external companies (e.g. company 2, coloured in yellow) might indeed be asked to co-operate to (re)-enforce an internal ‘value chain/process or configuration’ or even to develop new complementarities and technologies on product level.

Although perspective 2 might sound as the highest potential which offers several opportunities, a reference can be made to the argumentation defined above in relation to LCW’s current initiatives. Particular representatives already argued that high potentials, derived from inter firm cooperation, can only be obtained if the organisational configuration of LCW is correctly optimized. This means that as long as the internal organisation (perspective 1) is not able to increase its own efficiencies to a ‘minimum level’, it will not even be able to effectively cooperate with external partners (perspective 2) and create potential business solutions. Even if particular representatives of LCW would be able to create relatively higher potentials through cooperation with external partners, the question will be, whether LCW would be able to actually adapt or appropriate the potential benefits within the own internal organisation. On the other hand, this also results in the question whether new risks or dependencies will occur overtime.
Considering the latter with regard to figure 2.1.A, these aspects can be defined with regard to both companies. This results in the premise that representatives of both companies should understand and optimize their internal processes before they can actually create and share complementary value. In order to do this, particular processes or configurations between the different companies should (to a certain extent) be stated in parallel (see also figure 2.1.B). While doing this, certain inefficiencies (e.g. over/under capacity) or ineffective functionalities might show up and can be defined as new risks or potential business opportunities. Considering this ‘parallel act/value exchange’, a reciprocal function or mutuality can be defined. As mentioned above, this has been defined as the third perspective (see figure 2.1.A-C). This for instance involves an internal mechanism (e.g. an internal platform) which stimulates a creative interaction or exchange of potential added value between two or more companies while starting from internal perspective. As visualized, this perspective also involves a broader dimension, if considered overtime or in relation to potential partners, in or even outside an entire external network. This dimension offers even higher opportunities or risks on the long term.

Considering the 3 perspectives described above with respect to the ambitions of LCW, a special focus had been made on the third perspective. Considering this focus, several representatives of the initiatives (PPP Pilot LCW-DAS, MV and WCM) described within the former paragraphs have been asked to give their personal vision and perspectives. In order to guarantee the validity and reliability of the answers given, the methodologies used within this case study have been described within Chapter 4. The case study findings related to the answers given by the representatives have been described within Chapter 5, which resulted in a distinction between the external and internal dependencies and risks. This distinction is again based on the differences between perspective 1 and 2 as visualized in figure 2.1A-C. Therefore the descriptions given in Chapter 5 are further discussed within Chapter 6 according perspective 3. This discussion leads to a determination of particular business alternatives and potential solutions integrated in the (concrete) recommendations to LCW, see Chapter 7. In order to define, benchmark, and strengthen these alternatives and potential solutions, (scientific and management) literature has been used (see Chapter 3).
3 Literature review: Alliance Research

3.1 Introduction

Chapter 2 showed that the overall research question: ‘how potential added value of cooperation in a network could be effectuated to benefit the own internal organisation of LCW’, arose from the growing need for different collective forms of operation with public as well as private partners, to (in)directly guarantee LCW’s rights to exist, to strengthen its core activities, enforce and optimize its former position and processes, and strengthen the ambition to develop a ‘Centre of Excellence’ for military & civil aircraft and helicopter engine maintenance in the Netherlands. As mentioned in Chapter 2, the overall needs and ambitions of LCW have been strengthened by a decrease in Defence budgeting in combination with the increasing importance, magnitude and complexity of MRO services of Capital Goods available for the ‘out-of-area operations’ the Dutch Military is participating in. As mentioned according the trends in Chapter 2, these changes have been caused by a changing (end) consumer demand on Macro level. Considering these changing consumer demands LCW was enforced to review its internal perspectives and configurations. In order to overcome its responsibility and to benchmark, LCW became involved in several new initiatives which are strengthened by external partners in different industrial networks based on inter firm collaboration. These initiatives were said to be important due to the increasing intensity of knowledge involved and shared as required to optimize LCW’s internal business processes and overall performance.

Considering the overall research question in combination with the 3 perspectives stated in Chapter 2 (see also figure 2.1.A-C), mainly defined in order to focus on a successful creation and appropriation of potential added value of inter firm cooperation in a network in order to strengthen the internal process and product developments of LCW, as required to become a ‘Centre of Excellence’ for military & civil aircraft and helicopter engine maintenance in the Netherlands on the long term , this chapter contains a literature study chosen with respect to alliance research. Alliance literature namely contains 3 relevant levels of analysis similar to the required or underlying fields of interest integrated within the overall research question (see figure 3.1) respectively based on, a dyadic perspective, the firm level and the network level (Duijsters et al, 2004). In this sense, the first level of alliance research (see paragraph 3.3) based on a dyadic perspective on individual alliances focuses on the success and failure factors (fixed firm effects) of a strategic alliance between two related firms, by answering the question why a particular alliance might fail. In line with this, the second level of alliance research (see paragraph 3.4), based on intra firm antecedents of alliance performance, is dedicated to answer the question how firms should successfully manage their alliances overtime. The third level of analysis is defined considering a network approach (see paragraph 3.5) in order to determine the structural relation between and within industrial networks, which might manifest in a way that potential alliance opportunities will occur due to the fact that partners are via-via (indirectly) informed of other partners’ reputations embedded in or outside their former network boundaries (Duijsters et al, 2004). In other words, instead of only focusing on performance rates of individual alliances established in the past or focusing on a combination of intra firm management practices stated in line with these individual alliances, companies should continuously consider their network position and those positions of other partners within their entire industrial network. Considering potential opportunities, a network approach contains a relatively broader perspective, which means that companies should not only successful manage their alliances on an individual base, but also with regard to an entire portfolio of alliances.

Before these levels of alliance research are further discussed, the following paragraph starts with a perspective on the reason why and how alliances literature has increased within the last decades, including several different definitions and forms of an (strategic) alliance.
3.2 Between Market and Hierarchy

Although the underlying formations, causalities and trends (see Chapter 2) in the Dutch Military might be defined as unique with special regard to the formation of relatively new collective forms of (network) operation at LCW, a comparable transition in other industries took already place in the course of the 1980s (De Man, 2004). De Man (2004) described this transition as an emerging paradigm of organisation, in which collaboration between companies became the norm and companies actively sought partners to jointly develop business, instead of acting as autonomously as possible by creating an independent function based on the ownership of the most important resources and competences. Considering this transition and increasing trends with respect to inter firm collaboration, De Man (2004) noticed two underlying core perspectives. First of all, large (vertical) integrated companies started to focus on core competences, while outsourcing certain parts of their production process. Secondly, companies discovered a tremendous benefit through the formation of tighter integration with suppliers, instead of entering into a market relationship. In this sense, companies aimed for an inter organisation form of co-operation which can be defined as a hybrid mechanism (based on quasi-integration (Porter, 1980)), since it moves between the extremes of a market mechanism and a hierarchical form of operation. This hybrid mechanism has been defined as an ‘alliance’ (De Man, 2004).

While the underlying thoughts, causalities and needs might individually differ among a wide diversity of industries and companies, firms were somehow triggered and enforced by a growing number of structural and technical changes in the global era (De Man and Duijsters, 2004). In line with the fact that organisations were enhanced to change their business strategies to remain or become more competitive and market oriented, collective forms of operation were established in a sense that two or more independent organisations could temporary share reciprocal inputs, while maintaining their own corporate identities (Heimeriks, 2004). These collective forms of operation can be defined as ‘(strategic) alliances’ if the revenues and risks are shared among partners, and actual collaboration between people in the companies takes place (De Man, 2004). Considering the fact that partners maintain their own identities and share mutual risks and benefits, the definition of an alliance excludes agreements such as mergers and acquisitions, since these should be seen as entirely integrative agreements (Heimeriks, 2004). While defining inter firm cooperative arrangements (co operations) aimed to pursuing mutual strategic objectives, popular forms of (strategic) alliances include joint ventures, direct equity investments, (joint) research and development (R&D) agreements, research consortia, joint-marketing agreements, buyer-supplier relationships, and so on (Das and Teng, 2000). “Regardless of form, these arrangements are in some way open-ended and contain gaps typical of incomplete contracts. As a result, to deal with unforeseen contingencies, the partners need to make decisions jointly, although there is no automatic convergence in their interests. The alliance structure thus enables the parties to coordinate joint work and align interests better than arm’s length contracts. In other words, the alliance structure can be seen as an alternative to vertical integration for dealing with problems created by the incompleteness of contracts” (Gomes-Casseres et al., 2006).

Although alliances were not a new phenomenon, the number of technology alliances increased very rapidly since the 1980s, to several thousand new alliances annually (De Man, 2004). In line with this, a vast amount of literature has evolved around the topic of alliances (Das and Teng, 2000; Duijsters and Hagedoorn, 2000; Ireland, Hitt and Vaidyanath (2002); Heimeriks, 2004). Considering the fact that new alliance agreements were exploding, scholars referred to the fact that Strategic alliances seem to be effectively proliferating with increasing competition, globalization and innovation due to turbulent technological changes and new product and process development, but they argued as well that alliances tend to have relatively high instability- and failure rates (Das and Teng, 2000; Heimeriks and Schreiner, 2002; Heimeriks, 2004; De Man and Duijsters, 2004; De Man, 2005; Kale and Singh, 2007). For example Heimeriks (2004) mentioned the following: “Both the number of newly established strategic alliances per year and the percentage of revenues that stem from strategic alliances have increased significantly in recent years. However, scholars and practitioners alike have pointed at the poor track record of alliances that over time continue to report high failure rates, ranging from 40 to 60 percent”.

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Although different scholars rely on different performance measures to determine the level of success in general they report high levels of unsatisfactory performance levels whether they refer to financial, relational or learning effects (Duijsters et al., 2004). Considering the high instabilities and failure rates in relation to a firm’s performance, scholars started to identify the underlying antecedents of alliance performance according a wide diversity of common interests. (E.g.: strategic management, operations management, economics and organisation, sociology, marketing, innovation management, new product and process development). In general, the vast majority of studies related to alliance research has been served by perspectives based on organisational theories such as: the transaction cost theory, resource-based view, organisational learning theory, evolutionary economics, dynamic capability view, competence-based view, social network theory. Considering the fact that scholars distinguished these theories in relation to particular levels of analysis for alliance research, 3 major streams of alliance literature (illustrated in figure 3.1) could be identified, respectively based on, a dyadic perspective, the firm level and the network level (Duijsters et al., 2004). These levels of analysis are discussed within the following paragraphs. Although these levels are defined as distinguished streams in alliance literature, managers should implement these levels inherently.

Figure 3.1 Three levels of analysis in Alliance Research. (Adapted from: Duijsters et al., 2004 and De Man et al., 2001; De Man 2005; Heimeriks and Schreiner 2002; Heimeriks, 2004)

### 3.3 Inter firm Alliance Research: A Dyadic Relationship

According the need to understand the factors affecting alliance performance, traditional strategic perspectives based on the Transaction Cost Theory (Coase, 1937; Williamson, 1975, 1991, 1999; Klein, Crawford, Alchian, 1978; Dekker, 2004) and Industrial Organisation Theory (Porter, 1980,1990) were applied in the first instance, which resulted in the fact that (strategic) alliances were studied according a dyadic approach in order to reflect a cooperative agreement as a single transaction pursued to overcome market failure and industrial constraints (Heimeriks, 2004). The logic that follows from these theories is one wherein (large (vertical-) integrated, see above: De Man, 2004) firms were in general considered to be individual, self-fulfilling units that prefer going-alone over cooperative agreements (Heimeriks, 2004), since they were dedicated to obtain the lowest cost of transaction (costs related to writing, monitoring, adapting and enforcing contracts). These transactions costs were defined according their reliance on a combination of certain characteristics of the transaction taking place (i.e. asset specificity, uncertainty and frequency) and certain characteristics of human nature (i.e. bounded rationality and opportunism) (Dekker, 2004).
While considering alliances as dyadic relationships or distinct business transactions, scholars identified several inter-firm factors that should be taken into account in order to determine alliance performance (Heimeriks, 2004). For instance, issues as trust, (relational and performance) risk, partner fit and symmetry, commitment and complementarities between partners should be considered as significant factors of a single (strategic) alliance (Das and Teng, 2001; Heimeriks, 2004, Duijsters et al, 2004; Inkpen and Currall, 2004).

Considering the overall need to create, share and appropriate potential value and actually take a certain benefit from an inter firm cooperation as described in relation to figure 2.1.A-C, an interesting reference can be made to contributions made by Teece (1986 (see also Burgelman, Christensen and Wheelwright, 2004), 2006), who initially developed a (PFI) framework which was dedicated to the profiting act in/from technological innovation. Considering the question, “why innovation firms often fail to take profit from their innovations while customers, imitators or other industry participants actually benefit”, Teece (1986) described several manners to profit from technical innovation, fundamentally based on the following building blocks: an appropriability regime, complementary assets and a dominant design paradigm. An appropriability regime (based on legal instruments and the nature of technology) deserves great attention, since this reflects the ability to profit from an innovation, or considering the case study question, it reflects the actual needs in order to effectuate or protect potential added value based on high intensive technologies created through inter firm cooperation in a network, critical sources of knowledge, complementary assets and other resources. An article of Pisano and Teece (2007) further underpins the need for intellectual property in relation to industry architecture related to value capturing from innovation. Jacobides et al (2006) made an extension on Teece (1986) definition of capturing value, by defining a combination of value creation and value appropriation.

### 3.4 Intra firm Antecedents: Alliance Capability Research

Although a dyadic view (described in the previous paragraph) resulted in several relevant perspectives showing the fixed firm effects “why” particular alliances fail, some scholars argued that these insights were inappropriate or incomplete for scientific study in alliance research, since the underlying factors identified do not increase the understanding of the question “how” firms can increase their alliance success in general (Ireland, Hitt and Vaidyanath, 2002; Heimeriks, 2004). This led to a shift towards the firm specific or intra organisational antecedents (e.g. processes and mechanisms) underlying a successful realization of inter firm cooperation (De Man, 2005). This second perspective or level of analysis is known as the second stream of alliance research (see figure 3.1) mainly based on theories such as: resource based view, organisational learning theory, evolutionary economics theory, dynamic capability view and the competence based view (Heimeriks, 2004). Reflecting intra firm antecedents, this second stream is dedicated to identify issues underlying the organisational structures, its routines and management processes, organisation specific (cap)abilities (specific in a sense that (cap)abilities are difficult for others to imitate or buy (Heimeriks, 2004)) and the considerations concerning the exchange of knowledge, information, expertise and creativity (see Heimeriks (2004) for an overview of authors and contributions of the various theories).

Considering the internal propositions stated in paragraph 2.4, this paragraph contains a relatively broader perspective and insight than those aspects defined with respect to the inter firm antecedents stated according alliance stream 1. For instance, the following subparagraph starts with a dedicated focus on knowledge management corresponding LCW’s need to focus on internal knowledge and expertise to obtain a professional attitude towards customer and colleague. Moreover this paragraph contains an extra focus on human interactions, social capital & structural hole networks, performance metrics, mutual reflection and rewards systems.
3.4.1 Knowledge Management

De Man (2004) discussed the network approach in relation to its economical aspects together with Strategic, Structural and Managerial aspects. Features and perspectives on alliances and knowledge management have been discussed with respect to network collaboration. De Man (2005) mentioned the shift towards the focus on capability building between companies which fit together in one alliance. De Man (2005) defined alliance capability as: “the mechanisms or routines that are purposefully designed to accumulate, store, integrate, and diffuse relevant organisational knowledge acquired through individual and organisational experience of alliances”. The importance of the basic elements ‘experience and mechanisms’ has been emphasized. In line with this, ‘learning by doing’ has been stated as the first step for building alliance capabilities, followed by the necessity for the formalization of lessons learned within an organisation. In general De Man (2005) stated the question whether companies pay enough attention to alliance capability development. In relation to ‘the organisational experience needed’ De Man (2005) also focused on the differences between European and American companies with respect to these alliance capabilities. Considering the lessons learned, with respect to the latter focus, these might be relevant for the organisation of interest, since LCW is involved in a comparable program (JSF program) which mainly consists of American OEMs. De Man (2005) stated that “in many ways alliances are more effective means of doing business in the knowledge economy than industrial economy, as learning and gathering knowledge have almost become goals themselves”. Considering this with respect to the projects defined within Chapter 2, WCM(C) can be defined as an alliance developed with respect to a focus on the intensity of knowledge within a High Tech sector consisting of industrial experts.

3.4.2 Organisational Experience and Learning

Heimeriks and Duijsters (2007) presented Alliance Capability as a Mediator between Experience and Alliance Performance (see figure 3.2). Their study is centred in a way firms can enhance alliance performance through the development of alliance capabilities. They viewed alliance capabilities as a multilayered phenomenon: learning mechanisms (being organisational attributes such as an alliance department) are the building blocks of routines which again form the basis of a firm’s alliance capabilities.

![Figure 3.2 Performance of Alliance capability development through learning and experience gained. (Adapted from: Zollo and Winter, 2002; Heimeriks, 2004; De Man, 2004; Heimeriks and Duijsters, 2007; Kale and Singh, 2007)]
Heimeriks and Duijsters (2007) built on the principles underlying the resource-based view, organisational learning and evolutionary economics. This allowed them to investigate the process which lies at the root of a firm’s ability to integrate, acquire and develop capabilities through organisational learning. Heimeriks and Duijsters (2007) built further on the work of Zollo and Winter (2002) who focused on the mechanisms through which organisations develop alliance capabilities as based on three underlying topics; the role of experience accumulation, knowledge articulations and knowledge codification processes in the evolution of dynamic, as well as operational routines. Recently a comparable study has been published. Kale and Singh (2007) studied alliance capability development through learning in relation to the Firm-Level alliance success, as based on a learning or knowledge perspective. Kale and Singh (2007) suggested that the alliance learning process (involving; articulation, codification, sharing and internalization of alliance management know-how) partly mediates the direct, positive relationship between alliance function and the firm’s overall alliance success. According to this suggestion Kale and Singh (2007) concluded that alliance learning process acts as one of the main mechanisms through which the alliance function leads to alliance success. Kale and Singh (2007) mentioned that case studies would be needed in future to collect data on certain alliance practices as part of management processes within companies. This enforces the uniqueness and need for the overall case study findings at LCW as described within this report (see Chapter 4).

3.4.3 Learning Mechanisms

Heimeriks and Duijsters (2007) claimed that “By using a firm’s alliance portfolio performance as the dependent variable and by measuring alliance capabilities using a firm’s learning mechanisms, we were able to direct attention to the micro-level process of alliance capability development.” (Heimeriks and Duijsters, 2007). Alliance capabilities could be identified as the structural building blocks in a company’s Micro Level process to create and maintain a sustainable portfolio approach. To introduce several learning mechanisms, the alliance capabilities defined by Heimeriks and Duijsters (2007) might be used. Four groups of learning mechanisms have been deliberated: functions, tools, control and management processes and external parties illustrated in figure 3.3.

![Figure 3.3 Groups of learning mechanisms to develop alliance capabilities. (Adapted from; Heimeriks, 2004; Heimeriks and Duijsters, 2007)](image_url)
3.4.4 Levels of Capability

Heimeriks (2004) mentioned the importance of categorizing mechanisms in alliance management due to a great variety of reasons. Not only the ability of knowledge sharing inside the entire firm is noticed, the mechanisms defined, also help in day-to-day management practices and coordination & control responsibilities. Herewith he concluded that two factors could be derived, factor I dealing with performance increase by institutionalizing an alliance capability (at organisational level) and factor II dealing with the integration of critical knowledge (at group level). The two factors referred to the levels of a capability, known as Individual, Group and Organisational Level (see figure 3.4). These levels have also been used in article of Eaton et al. (2006) in order to structure their research on Private Finance Initiative/Public Private Partnership (PFI/PPP) projects. Eaton et al. (2006) made a focus on the stimulants and impediments to innovation within PFI/PPP projects. Considering the nature of their research, literature of Eaton et al. (2006) is highly relevant in order to strengthen this case study, also due to the fact that research on PPP within a military context has been taken into account. This approach can somehow be strengthening by literature findings of Versailles and Mérindol (2006). Versailles and Mérindol (2006) presented three levels of knowledge according their study in Defence aeronautics (The JSF F-35 fighter jet and the F/A 18 fighter attack jet): Technical, systematic and strategic. Note that their study took place in a comparable context based on knowledge transfers and R&D management within the Defence Industry as related to the JSF F-35. Apart from this they also reflected the relation between cooperative and competitive learning.

![Figure 3.4 Role of mechanisms in alliance capability development. (Adapted from Heimeriks, 2004)](image)

Heimeriks (2004) related capability curves (see figure 3.4) to levels of experience, arguing that “There is an optimum or maturity in the level of capability each stage can bring, but it requires a complex interplay of various factors to get to the next stage of the lifecycle.” (Heimeriks, 2004). The difference in usefulness of the group and organisational learning mechanisms has been emphasized. Group levels were stated to be especially useful to transfer knowledge with regard to dyadic alliance management issues, while the organisational level was related to mechanisms with their purpose to support the entire alliance portfolio of the firm. Considering this, the question is how individuals can be enhanced to enforce a successful operation or actual use of organisational (learning) mechanisms.
3.4.5 Dissemination of Knowledge and Human Interaction

Focusing on the combination and dynamical aspect underlying the levels of capability in figure 3.4, a reference can be made to the third perspective stated in the personal perspectives of Chapter 2. Considering the combination or actual exchange between the external and internal perspectives or antecedents within an organisation, knowledge management should be considered overtime. For example, distribution of strategic knowledge or resources as gathered outside a former organisational setting should be enhanced overtime within an organisation to stimulate the effectuation of potential added value. Considering the descriptions in Chapter 2, this might strongly depend on the human and cultural interaction as embedded in former organisational believes in the past. Considering this a focus might be made on the effect of organisational barriers in general, stated in the past in order to protect the entire organisation with respect to certain risks and treats. In line with this, a general focus might be made on the effect individuals (or groups of individuals) have and experience according particular risks and threats related to each level of capability stated. In line with this, several questions might be stated with respect to the evolution and adoption of external knowledge over time. Especially the adoption and integration of external knowledge by individual participants or on subjective job levels might be identified as a new focus in alliance research. Heimeriks and Duijsters (2007) came up with comparable arguments while discussing opportunities for future research, they stated that having certain deliberate learning mechanisms in place does not guarantee successful dissemination of knowledge. They stated that it would be highly relevant to make contributions to alliance research by investigating the influence of additional variables reflecting the actual usage of certain learning mechanisms. A link might be made by focusing on subjective or individual needs and these additional variables needed to effectuate potential added value form external knowledge related to groups of learning mechanisms within an entire organisation. Considering these additional variables with respect to the intensity of knowledge mentioned, literature of Hislop (2005) might be used in order to define certain aspects on the human and social interaction of organisational learning within alliance research. For example the identification organisational barriers as defined by Orllilowski (2002) in Hislop (2005) might be linked to individuals or groups of individuals within organisations in order to determine ‘social resistance’ and risks in relation to distribution or integration of external knowledge or resources needed to effectuate potential added value. In line with this literature of Hislop (2005, p. 50) might be relevant with respect to organisational commitment and willingness of individuals to share knowledge according different forms of resources. In line with this, literature according the “organisational absorptive capacity “ stated by Hislop (2005) might also be relevant to further underpin and identify variables of learning mechanism and human and cultural interaction overtime. Underlying potential behaviour of these individuals involved, literature findings of Huber (1991) might be used to reflect the idea of ‘unlearning’ in order to strengthen the idea that participants should first become ‘free and open minded’ to create, adapt and learn new insights.

Considering knowledge exchange overtime, literature of Grossman (2007) or Kudyba (2005) might be especially relevant in order to define the relevancy of cross functional transfers of knowledge needed to strengthen intra firm processes and creativity. This cross functional nature might be extremely important since this strengthens the need to re-consider the mutuality or combination between internal and external perspectives. In order to fasten the exchange of knowledge, a reference might be made to the collective nature of competition illustrated in figure 3.5. Individuals or groups might have to be enhanced to compete to others in order to speed-up their learning processes. To enforce this perspective, literature of Hamel (1991) might be used, since this focuses on the learning aspects within international strategic alliances.
3.4.6 Social Capital and Structural Hole Networks

Comparable findings with respect to the dependency on human interaction in alliances have been defined in relation to ‘social capital’. For example Walter et al (2007) can be used to strengthen the relevancy of human interaction in knowledge transfers between and within alliance partners. Walter et al (2007) might be especially relevant to this case study since it discusses the mutuality between private and collective benefits of social capital. Especially since, the public sector overlying this case study has a collective nature as well. This mutuality also reflected the social difference in closed and open networks and its underlying structures. Considering this mutuality a reference can again be made to the mutuality in the perspectives stated in Chapter 2. This, due to the fact that Walter et al (2007) made a focus on the internal and external networks of an organisation to define different configurations which are influencing the ability to acquire knowledge from alliance partners and to diffuse knowledge across its business units (see also paragraph 3.5 which is used to define several contributions made on network level). Considering this with respect to the knowledge intensity of potential additional value, the underlying principles of a social network might be relevant within this case study. In line with the social capital approach, Walter et al (2007) described topics as network density and structural holes in relation to the opportunities which can be obtained within a social network within or outside and organisational network. In line with this literature of Collins and Hitt (2006) might be relevant, since they described the effect of ‘social and relation capital’ in line with additional value through tacit knowledge transfers within social communities within an organisation. Another interesting underpinning with respect to these individual roles, can be made by literature findings of Cohen and Levinthal (1990) according a firms absorptive capacity in relation to innovation. Cohen and Levinthal (1990) stated that: “the firms absorptive capacity depends on individuals who stand at the interface of either the firm and the external environment or at the interface between subunits within the firms”. Focusing on this interface, again a reference can be made to the third perspective in Chapter 2 stated with regard to the combination between inter and external perspectives. This individual effect can also be underpinned by a focus of Jones (2006). Jones (2006) focused on the change agent’s role in order to develop absorptive capacity in mature organisations. (Note that within Jones (2006) a reflection has been made to the Ministry of Defence as well.) Other references might be made to Hustad (2004), who reflected the transfer of knowledge in relation to human aspects and networking as well and defined several critical success factors in relation to community building processes.

3.4.7 Performance Metrics and Mutual Reflection

A measuring act should be considered and developed to determine and reflect particular performance or process outcomes, to enable the reformulation or re-action on processes stated with respect to the overall alliances formed within a network or portfolio. In line with this perspective, literature of Hughes (2002) might be used. Hughes (2002) stated several principles with respect to the implementation of Alliance metrics. Within this article the impact of alliance metrics is linked to the relationship between partners. So it might be important to focus on mutual agreements between partners within a network overtime. Comparable findings of alliance performance measuring might be derived from an article of Spivey et al (2009) who introduced an alliance scorecard. Within this article a focus is emphasized with respect to successful operations after a partnership has been formed, rather than focusing only on the likely problems to be encountered in a proposed collaboration. Again the importance of knowledge management is highlighted in combination with asset management, value disciplines and enterprises equity. In line with this the importance of sharing and technology transfers are emphasized as well. Even more important is the focus on empowerment in decision making and a development of a ‘can do’ attitude with respect to strong integration teams.
Considering a ‘can do’ attitude with respect to performance outcomes and organisational learning, an interesting methodology originally developed within the U.S. Army (Darling et al. 2005; May, 2005; Schindler and Eppler, 2003; Wheatley (1994)) might be considered with respect to the identification or problems arrived within certain collaborations. This methodology is defined as an ‘After Action Review’ (AAR) and stimulates learning by-doing from experiences related to the identification, reflection and sharing of mutual shortcomings directly after an operation. This methodology stimulates sharing and organisational learning by short evaluations just after an operation. Lessons learned with respect to certain evaluations, reflections or feedback loops, might be relevant focusing on single or subjective forms of operation, but an overall view with respect to an entire portfolio or network should be taken into account as well. For example, implementers might have to be aware of a certain biases which negatively influences an overall or a long term objective or performance outcome, due to fact that the evaluations are directly carried out after a particular task experienced.

3.4.8 Reward Systems

In order to stimulate reflections and performance outcomes, individuals might have to be rewarded or punished with respect to the (sub) objectives stated within a performance metric. Underlying this form of encouragement, a focus might be made on the fact that people should be rewarded with respect to the utilization of external (additional) sources of knowledge or other complementary assets or resources, within the own internal organisation (Stated by Hislop (2005) in relation to a Not-Invented-Here Syndrome). In line with this rewards systems might have to be tailored with respect to individual, group and organisational performance outcomes, in combination with personal or mutual needs which affects someone’s or an organisation’s incentive to collaborate or to put extra effort in potential and unforeseeable benefits. In order to develop and underpin the need for certain reward systems, literature of Gibson et al (2003) on organisational behaviour and human performance management, might be relevant. Considering this especially the recognition of intrinsic and extrinsic forms of motivation to collaborate might be important.

3.5 Alliance networks: Creating Potential Alliance Opportunities

As mentioned, 3 levels of analysis could be identified within alliance research (see figure 3.1). As mentioned, the third level of analysis is defined considering a network approach in order to determine the structural relation between and within industrial networks, which might manifest in a way that potential alliance opportunities will occur due to the fact that partners are via-via (indirectly) informed of other partners’ reputations embedded in or outside their former network boundaries (Duijsters et al, 2004). So, instead of only focusing on performance rates of individual alliances established in the past or focusing on a combination of intra firm management practices stated in line with these individual alliances, companies should continuously consider their network position and those positions of other partners within their entire industrial network. This might mean that companies will develop new visions and ‘new potentials’ towards the future, which they had not create if they did not cooperate earlier with other partners in a network. In line with this, representatives might think ahead if and how the current and (in-house) developments (prospected) will (re)-occur. Although people might argue that this will (currently) be out of scope, a certain ‘ambidexterity’ might be considered in relation to the current ‘in-house’ effectuation of potential added value of network cooperation.

(For instance, apart from the fact whether the JSF will replace the F16 or not (see trends and backgrounds case study LCW, Chapter 2), particular representatives of LCW should have a clear vision or mission towards the future and LCW’s right to exist. So to a certain extent, a (personal) perspective might be added by stating that the internal organisation should be able to adapt this or any form of technical or functional replacement. An agreement might even be made on the assumption that the functional forms of change might even be the same as approximately 30-50 years ago (replacement …) and will be (partly) similar in 30-50 years time (replacement JSF?). It might be interesting to study this especially considering the propositions stated in Chapter 2 with regard to a ‘Centre of Excellence’, but it would currently be irrelevant and time consuming. In line with this global or external perspective, the following and challenging question can be asked: ‘are particular perspectives changing overtime, with regard to investments made in acquisition, inter-firm cooperation and product life cycle or maintenance costs of Capital Goods and how?’ Note that this is again inherently to the consumer demands as described in Chapter 2. Considering this, a personal agreement can be made on the challenges and uniqueness as related to the overall JSF program/network and governmental mindset on Capital Goods.)
3.5.1 Differing (External) Network Positions

The perspectives described above have been derived according the premise that companies might find potential alliance opportunities due to the fact that partners are via-via (indirectly) informed of other partners’ reputations as embedded in or outside their former network boundaries. This perspective can be strengthened by Gulati (1998) who argued that many new opportunities for alliances were presented to firms through their existing sets of alliance partners, after they initially reflected the possibility for new opportunities within their existing relationships. Considering the fact that this formation is based on the human interactions between representatives of different organisations, again a reference can be made to the relevancy of ‘social capital’ as defined (e.g. in Walter et al., 2007) in relation to the ‘structural holes within the organisation (see subparagraph 3.4.6). Also Capaldo (2007) stated that: “in social network research micro and macro can be very similar theoretically and methodologically, and thus theories and constructs initially developed for the study of interpersonal relationships are frequently applied to the analysis of inter-organisational linkages”. (Although this might mean that the same principles or theories might be applicable to both internal as well as external networks, managers should be aware of the risk of ‘generalizing’ particular theories, especially in relation to this mutuality). In line with the premise that partners might be informed of each others’ connections with other partners, companies should clearly consider their position in an overall network by reflecting three particular positions a company may occupy: “Group member”, “Bridge”, “Orchestrator” (Chapter 3, De Man, 2004). For instance, regarding figure 3.1, organisation ‘A’ might be defined as an “Orchestrator” or ‘Core’ partner (Central Player) in the network, while organisation ‘E’ forms a ‘Bridge function’ between organisation ‘A’ and ‘F’. In this sense a former group member or partner positions itself between two unconnected partners (or networks), which might lead to new alliance opportunities or complementarities in the future (see Chapter 3, De Man (2004), for an overview of advantages and disadvantages these network positions might contain).

To strengthen the relevancy of the underlying levels of analysis in alliance literature concerning the overall field of interest within this case study, a reference can be made to an article of De Waard and De Man (2005), which discusses the increased need to apply a network approach in a same military context. In their article they focused on a network analysis related to the participation of Dutch actors within the JSF program. In line with their analysis they mentioned the need to further extend literature related to the role public partners have and how they maintain and manage their internal process towards the successful participation in an industrial network of public and private actors. Another example of the potential revenues these networks (in particular the JSF program) or underlying inter firm co operations might offer, a reference can be made to an article of Van de Vijver and Vos (2006). In line with their analysis they argued that potential revenue of participating in the JSF program is based on the spin-offs and spill –over effects an actor might realize through transferring JSF specific knowledge to other settings which is essentially based on a dedicated development of specific dynamic capabilities within an organisation.

3.5.2 Constellations: Collective Competition

Considering potential alliance opportunities and additional value, a network approach contains a relatively deeper and broader perspective, which means that companies should not only successful manage their alliances on an individual base, but also with regard to an entire portfolio of alliances (Gulati, 1998; De Man, 2004; Gomes Casseres, 2004; Capaldo, 2007; Lavie, 2007). Gomes Casseres (2004) namely argued that people missing the point by thinking that ‘the survival of one single alliance’ is the goal rather than the success of the overall alliance strategy. This again reflects the attitude or willingness to understand alliance failures and instability as earlier defined in paragraph 3.3. In line with this perspective, Gomes Casseres (2004) stated that the evolution of the relationship over time is considered to be more important than the initial deal made. A ‘post-deal’ management approach is mentioned to be important cause of the ‘open-ended and ever changing’ nature of alliances. These natural phenomena can be related to ‘the era of open innovation’ as described by Chesbrough (2003) which deals with the organisational opportunities to commercialize its own ideas and innovations from other firms. Open innovation stimulates a search for new ways needed to bring in-house ideas to the market by deploying pathways outside a company’s current businesses.
According the broader and deeper perspectives on alliance networks, collective groups of cooperation companies will become or (re-) enforce their strategies and abilities to compete/defend them self. This collective form of competition and collaboration is based on the strategic formation of a “constellation” (Gomes Casseres and Bamford, 2001). Gomes Casseres (1996; 2006) defined constellations as groups of firms who have alliances among high-technology firms and forge new units of economic power and compete against other groups and against traditional firms. Figure 3.5 illustrates a shift towards ‘collective competition’ referring to “the economical behaviour of competitors consisting of more than one firm” (Gomes Casseres, 1996; 2006). (“The horizontal axis in this figure indicates the structure of the market, the distinction between one, a few, or many competitors is a simplified scale reflecting traditional Industrial Organisation (IO) market structures. The vertical axis measures the structures of the players in the market, specifically, the number of firms in each economic unit” (Gomes Casseres, 2006).

The following perspectives can be added to enforce this collective form of interest “as bilateral agreements between two firms cannot guarantee the success of the whole firm or this single alliance. Companies still have to change their mental models and change to a network mindset of qualitative, informal and relational aspects. “Without this network attitude, firms will not be able to benefit from being embedded in a network” (Geurts and Van der Zee, 2001). So, this might mean, that when the topics of the first and second stream of alliance research are considered, a particular outcome of performance is only guaranteed when an overall mindset has been created and will be continued over time. These perspectives enhance a mindset necessary in order to successfully operate and to accomplish complementary needs or goals stated underlying the overall alliance(s) formed. The fact that an overall focus should be enhanced can be underpinned by an interesting article of Jones et al (1998) used to define the influence of strategies and capabilities of Professional Service Constellations or alliances to enhance collaborative stability and change after an alliance has official been formed. Jones et al (1998) argued that firms may focus on individual or collective advantages within a constellation to influence the stability (‘polygamous’) and change (‘promiscuous’) rates, followed by different scopes of activity and by employing different means for coordination and safeguarding the firms exchanges. Lavie (2007) can be used to strengthen the perspectives on the essence of alliances portfolios in relation to firm performance. Especially the difference between a bilateral and multilateral form of competition and relationships between partners in a portfolio is mentioned.
3.6 Reflection Literature Review: Alliances Research

This chapter described particular literature findings used to enforce the recommendations given (see Chapter 7) within this case study. With respect to the overall research question and perspectives stated in Chapter 2 (see also figure 2.1.A-C), ‘Alliance literature’ has been selected to define inter firm cooperation. In line with this choice, 3 relevant levels of analysis similar to the required or underlying fields of interest integrated within the overall research question have been described (see figure 3.1) respectively based on, a dyadic perspective, the firm level and the network level. Although these levels are defined as distinguished streams in alliance literature, managers should implement these levels inherently.

Before these levels of alliance research were discussed in greater detail, paragraph 3.2 showed a certain similarity between: the underlying formations, causalities and trends in the Dutch Military as defined in Chapter 2 in relation to LCW, and a comparable transition in other industries (emerging paradigm of organisation) which took place in the course of the 1980s as described within alliance research literature. In line with this historical transition, an ‘alliance’ has been described as a hybrid mechanism, moving between the extremes of a market mechanism and the hierarchical form of operation. Furthermore, several definitions and forms of alliances have been defined as well. In line with this, paragraph 3.2 showed as well that although alliances were not new phenomena, the number of technology alliances increased rapidly since the 1980s. According to this increase, scholars started to pay attention to alliance performance which resulted in a vast amount of literature around this topic. In line with the fact that new alliance agreements were exploding, scholars referred to the fact that strategic alliances seem to be effectively proliferating with increasing competition, globalization and innovation due to turbulent technological changes and new product and process development, but they argued as well that alliances tend to have relatively high instability- and failure rates. Considering these high instability- and failure rates, scholars started to identify and study the underlying antecedents of alliance performance according a wide diversity of common interests and theories. For instance, theories as: the transaction cost theory, resource-based view, organisational learning theory, evolutionary economics, dynamic capability view, competence-based view, social network theory, were applied within alliance literature.

Reflecting the literature findings described according each level of analysis, a ‘dyadic’ (inter- firm) perspective on individual alliances focuses on the success and failure factors (fixed effects) of a strategic alliance between two related firms, by answering the question ‘why’ a particular alliance might fail (see paragraph 3.3). Although this dyadic view resulted in several relevant perspectives, scholars argued that these insights were inappropriate or incomplete, since the underlying factors indentified, do not increase the understanding of the question ‘how’ firms can increase their alliance success in general. Therefore the second level of analysis is used to the describe the ‘intra firm’ antecedents of successful inter firm cooperation, through the identification of issues underlying the organisational structures, its routines and management processes, organisation specific (learning) (cap)abilities/mechanisms and the considerations concerning the exchange of knowledge, information, expertise and creativity and value appropriation (see paragraph 3.4). Moreover this paragraph also contained an extra focus on human interaction, social capital & structural hole networks, performance metrics, mutual reflection and rewards systems. Finally, the third level of analysis contained a network approach, dedicated to identify the differences between the network positions a company might obtain (see paragraph 3.5), involving the determination of the structural relations between and within industrial networks, which might manifest in a way that potential alliance opportunities will occur due to the fact that partners are via-via (indirectly) informed of other partners’ reputations embedded in or outside their former network boundaries. Considering a broader and deeper perspective, this network approach is also used to reflect ‘collective competition’ (formation of ‘constellations’) in an external network. Considering the definitions given regarding an external network, a comment is made with respect to the contradiction and mutuality between scientific literature on internal and external networks.
Although these three levels should be integrated inherently, we might somehow conclude that the literature findings described according the second level of analysis ‘intra firm antecedents’ would deserve the greatest attention and contain the highest level of relevancy towards this case study. This can be underpinned by the fact that literature on ‘intra firm antecedents’ contains relatively more potential solutions, in comparisons to literature on ‘inter firm Alliance research’ which is somehow limited by the answers given according the question ‘why’ inter firm co operations fail.

‘Intra firm alliance literature’ can therefore especially be used to answer the question ‘how’ particular co operations should successfully be effectuated from an internal perspective. Since, it somehow reflects comparable topics as integrated in the propositions stated in Chapter 2. These propositions describe LCW’s internal need, core values and cultural changes required in line with the former reorganisations and historical backgrounds, and ambition to develop a ‘Centre of Excellence’ for military & civil aircraft and helicopter engine maintenance in the Netherlands (see paragraph 2.4).

Apart from the fact whether the literature findings defined within this chapter are relevant to benchmark or strengthen the recommendations given to LCW (Chapter 7), several comments were made reflecting the relevancy of the lessons learned within this case study, for scientific and management purpose in different fields (domains) of interest or industries. This involves the opportunity to ‘generalize’ particular (literature- as well as case study-) findings and to apply these results to a larger extent. Although ‘generalizing’ sounds opportunistic, readers should be aware of particular pitfalls described in Chapter 4 considering the external validity and feasibility of these case study findings. Considering ‘generalization’, paragraph 4.4.3 gives a short determination to answer the question, which other (comparable) organisations might learn from and improve themselves through applying the lessons learned and recommendations given within this case study. See also Chapter 6, paragraph 6.5.
4 Research Methodology: A Case Study Approach

4.1 Introduction

In order to guarantee the quality of the overall findings and recommendations given within this report, this chapter is dealing with the determination of the methodologies chosen according to the overall research project. Instead of using experiments, surveys, histories, and the analysis of archival information, this research project contains a case study approach. This case study approach can be defined as “an empirical inquiry that investigates a contemporary phenomenon within some real-life context, especially when the boundaries between phenomenon and context are not clearly evident” (Yin, 2003).

Considering the nature of the overall research question (“how potential added value of cooperation in a network could be effectuated to benefit the own internal organisation of LCW”), initial perspectives, trends and propositions, and literature findings as respectively described within Chapter 2 and 3 according to LCW’s needs, requirements and ambition to develop a ‘Centre of Excellence’ for military & civil aircraft and helicopter engine maintenance in the Netherlands, the following paragraph describes the methodical characterisation of the case study approach defined by Yin (2003), in terms of: its general applicability and the different types of purpose (namely exploratory, descriptive, and explanatory).

In line with the methodical characterisation of the case study approach, paragraph 4.3 is used to define the population chosen. Paragraph 4.4 follows with a description of 4 underlying tests stated. These tests were defined by Yin (2003) in order to determine the quality, in terms of “the construct-, internal- and external validity and reliability”, of the overall methodologies and instruments used within this case study. Considering the ‘construct validity’ (Conceptual) a list of potential sources of evidence (Yin, 2003) has been stated as applied and further discussed within paragraph 4.5 in order to define the actual data collection. Secondly, the ‘internal validity’ (Causality) has been defined with special regard to the causalities and relationships among the interview questions stated with regard to the overall scope of interest as defined within Chapter 2. Thirdly, the ‘external validity’ (Domain of interest) has been described with respect to the considerations to generalize the case study findings to a relatively broader domain of interest. As mentioned in Chapter 3, this involves the question which other (comparable) organisations might learn from and improve themselves through applying the lessons learned and recommendations given within this case study? Although the overall validity might be guaranteed by these three tests, the quality should be considered over time. Therefore the fourth test described is used to determine the ‘reliability’ of data and methodologies used, with respect to the form of repetitiveness. As mentioned above, paragraph 4.5 continues with a description of the actual collection of data, which mainly involves a practical reflection on the construct validity of this case study. In line with this, paragraph 4.6 gives a short description of the fact how the data collected has been processed and examined, with special reference to the ‘internal validity’ as defined among the four test in paragraph 4.4. Furthermore, paragraph 4.7 discusses the final determination and justification of analysis and decisions made with respect to the composition of respectively Chapter 5, 6 and 7. For instance, the ‘underlying causalities, risks, dependencies, and initial perspectives and propositions’, defined with respect to the formation of the interview questions, has ‘partially’ been linked to the causal inferences and/or order of the case study findings as defined within Chapter 5. The discussion stated in Chapter 6 is used to further strengthen and reflect the case study findings stated in Chapter 5 through applying and referring back to the practical relevance of particular literature findings within Chapter 3. In line with this, the recommendations given in Chapter 7 have been described in parallel to these findings and discussions as well.

Finally this chapter involves a reflection on the overall topics defined according this research project. In line with this, particular suggestions are given for further investigation.
4.2 Methodical Characterization: Case Study Research (Yin, 2003)

In general, a case study approach is applied as “the preferred strategy when ‘how’ and ‘why’ questions are being posed, when the investigator has little control over events, and when the focus is on contemporary phenomenon within some real-life context” (Yin, 2003). This case study approach can be applied in many situations with a distinctive need or desire to understand complex social phenomena, and allows the investigators to retain the holistic and meaningful characteristics of real-life events, such as individual life cycles, organisational and managerial processes, neighbourhood change, international relations and maturation of industries (Yin, 2003). Considering this, in relation with the contextual background, its trends, propositions and initial perspectives stated according the research question formulated, the overall problem identification and scope defined within Chapter 2, this research project can indeed be defined as a case study. Especially, with regard to the internal and external complexities which occur/exist due to the undiscovered or undefined causalities, dependencies and risks, requirements and needs, which are continuously changing due to a relatively unpredictable consumer demands within certain related industrial markets on national and international level as influenced by political decision making processes. Considering the human interactions as defined regarding the cultural changes within the internal organisation (see paragraph 2.4) a large complexity exist on the social perspectives and attitudes underlying the former reorganisations described.

In addition to the determination of the applicability of the case study approach as defined above, several variations within case studies have been considered. For instance, the premise that case studies can be based on any mix of quantitative or qualitative data (Yin, 2003), has been considered, even though the case study described within this report has mainly been based on qualitative rather than quantitative data. Among the case study variations, Yin (2003) mentioned several different applications: e.g. the need to explain the presumed causal links in real-life interventions, the need to describe particular interventions and its real life context (including its illustrations), the exploration of particular situations having no clear set of outcomes. In line with these different forms of application, a meta-evaluation (a study of an evaluation study) has been mentioned as well.

As mentioned in the definition of a case study, the boundaries between the phenomenon and context studied within a case study are not always evidently clear. Considering this in relation to the data collections being obtained in combination with the analysis made in line with the data collected, the case study inquiry copes with “the technical distinctive situation in which there will be many more variables of interest than data points”. In this sense, these inquiries rely on “multiple sets of evidence” which should be used inherently in a ‘triangulating fashion’ (Yin, 2003; p14, 97). As another result, a case study inquiry benefits from “the prior development of theoretical propositions to guide data collection and analysis”. Considering this, Chapter 3 described several relevant literature findings corresponding the required or underlying fields of interest integrated within the overall research question stated in Chapter 2. In order to determine the multiple sets of evidence used in relation to the overall case study described within this report, the following paragraph shortly reflects the population (unit of interest) based on the problem identification as described within Chapter 2. To guarantee the quality of the empirical investigations made regarding these sets of evidence, paragraph 4.4 discusses the description of 4 underlying tests stated by Yin (2003).
4.3 Population

In order to guarantee its right to exist and to develop a certain ‘Centre of Excellence’ on the long term, LCW is involved in several Industrial Networks. Considering this and to delineate the researchers’ scope, 3 major strategic developments were selected in order to focus on: a Public Private Partnership (PPP) Pilot between LCW and DAS, a redesign known as ‘Maintenance Valley’ (MV) and World Class Maintenance (Consortium) WCM(C). These long term initiatives described in respectively subparagraph 2.4.2-2.4.4 can be seen as relatively new bilateral and multilateral collaborations or networks between LCW and external partners (Public and Private), initiated to create and appropriated potential added value with regard to Maintenance Repair and Overall (MRO) services of Capital Goods in the High Tech (Defence) Industry as directly and indirectly related to the core activities and ambition of LCW to develop a ‘Centre of Excellence’. Although LCW is involved in a large amount of industrial networks, the selection defined above has been chosen according the ‘latest and most influential’ (internal as well as external) developments ‘as proposed’ in line with the overall research question formulated. In line with this selection, several representatives have been asked to give their personal vision and (internal) perspectives. Considering the scope and problem identification described in Chapter 2, this mainly involved several (senior) representatives of: the Defence Materiel Organisation LCW, Dutch Ministry of Defence, Dutch Ministry of Economic Affairs, and private institutions.

4.4 The Quality of Empirical Investigation

Considering the quality of the empirical investigations underlying this case study, the overall methodologies resources and instruments used, four general tests as defined by Yin (2003) could be applied in terms of “the construct-, internal- and external validity and reliability”. This determines the fact whether particular descriptions given do indeed reflect the actual case being studied, whether perspectives and expectations are based on the actual overall objectives and facts instead of (subjective/individual) personal feelings or matters which are relatively ungrounded and affected by emotion of particular representatives. These tests underpin how and why particular external sources could be used to benchmark and strengthen the recommendations given. In reverse, this also determines the question whether other (comparable) organisations might learn from and improve themselves through applying the lessons learned and recommendations given according this case study. Finally, these concerns are considered with respect to a longer period in time, which demonstrates the possibility to repeat particular methodologies with the same functionality and comparable results.

4.4.1 Construct Validity

To establish correct operational measures for the concepts being studied, as required to strengthen the validity of the constructs, this case study contained a selection of specific types of change or alternation defined in the previous paragraph corresponding the definitions integrated in the overall research question. In particular, 3 major developments were selected in correlation with the fact that they are fundamentally based on the need to successfully operate inter firm co-operations within an industrial network as related to the long term ambitions and initiatives of LCW. Considering the mutuality between, these inter firm co-operations in relation to the overall transition within the European/Dutch Defence Market/Industry described in Chapter 2, scientific literature findings with respect to alliance research have been used to structure, benchmark and strengthen the recommendations given within this report (see also Chapter 3). Considering the explorative nature of an ‘internal form of effectuation’ as integrated in the overall research question as well, the overall sources of evidence were preliminary selected from internal perspective. In line with this several (multiple) internal sources were selected and obtained in different manners to reduce the possibility that individual or subjective sources would negatively bias the overall process of data collection (see also paragraph 4.5). In order to structure and determine the strengths and weaknesses underlying particular sources of evidence, table 4.1 has been applied.
Table 4.1 Six sources of Evidence: strengths and weaknesses. Adapted from Yin (2003).

### 4.4.2 Internal Validity (Causality)

Although different multiple sources of evidence have been integrated (see also paragraph 4.6), the relevancy of the in-depth interviews used should be emphasized considering the initial need to target and directly focus on the case study topic itself, together with the possibility to identify the underlying causalities to determine the internal validity of the overall case study. The internal validity has therefore been strengthened by focusing on the fact how the interview questions are ordered and linked to each other and how they are related to certain initiatives, activities and phenomena in relation to the overall scope of interest as described in Chapter 2. For instance, in this case, the question how particular risks related to certain objectivities could be reduced, (see also Question 3, figure 4.1) is referring back to the answers given according the initial description of the overall objectives and risks defined in relation to the 3 major developments selected according the long term ambitions of LCW. According these concerns question 5 (figure 4.1) is highly important since it addresses the need to reflect whether particular performance outcomes do actually meet the overall objectives and conditions stated. In line with this question 6, is important to stimulate respondents to (re-)think about particular shortcomings, successfulness and to actually take further actions. So, the respondents were enforced to think about and to come up with the causal relationships between the answers given. This implicitly enforced the respondents to think about the fact how certain conditions lead to other conditions and reverse. Therefore the interviews used might be seen as a rhetorical form of questioning. This meant that respondents could be positively or negatively influenced by the interview questions. Considering this, the interview questions used within this case study were carefully discussed with all supervisors before the actual interviews took place. Finally, all interviews were completed by stating an additional question to enforce the respondents to (re)think about the overall transition in the European Defence Industry/ market, to reconsider the major trends on Macro Level and to come up with new opportunities towards the future. The answers given were somehow used to enforce and validate certain comments made with respect to the former questions and to further strengthen the historical trends as described in Chapter 2.
Question 1. Which (sub) objectives can be identified to determine the ‘potential added value’ in Public Private Partnerships (PPP) (network co-operations), while starting from internal organisational perspective? And how will these be accomplished (on a short and long term)?

Question 2. Which potential Risks or impediments might occur according the objectives given in Q1?

Question 3. Which (internal and external) Precautionary Risk measuring or PPP stimulants (or business opportunities) might be relevant in order to overcome the potential risks and impediments as given in Q2?

Question 4. How should Precautionary Risk measuring and PPP stimulants as described in Q3 be implemented?

Question 5. How might the (overall) performance be measured, evaluated and reviewed?

Question 6. What will be done with the results as derived from the performance outcome in Q5?

Additional: (Do you personally recognize a major development or overall trend, in comparable network co-operations between Public and Private Partners?)

Figure 4.1 Interview Questions Case study LCW.

4.4.3 External Validity: Generalizing Case Study Findings

The third test defined by Yin (2003), deals with the problem of knowing whether particular results or case study findings are generalizable beyond the immediate case study, also known as the ‘external validity’ (Domain of interest). In other words this deals with the question whether other (comparable) organisations might learn from and improve themselves through applying the lessons learned and recommendations given within a single case study. Considering this, a generalization of the case findings within this report should be considered as analytical rather than statically (e.g. Survey research). When relying on such an analytical generalization, Yin (2003) mentioned that a particular set of results is strived to be linked to some broader theory. Therefore, theories or overall perspectives used to lead or strengthen this case study, are the same theories or overall perspectives, which can be used to identify the underlying core aspects of other cases to which the results are generalizable. In this sense, the scientific and management literature findings of specific/comparable areas of interest (Alliance research) described in Chapter 3 related to the propositions as initial perspectives stated in Chapter 2, can also be used to determine which and whether other (comparable) organisations might learn from and improve themselves through applying the lessons learned and recommendations given to LCW as described within this report. Findings and lessons learned from this case study might therefore be relevant and for instance be integrated in other initiatives based on the mutuality within the underlying principles of switching between a “market mechanism and a hierarchical form of operation” (see paragraph 3.2). In more practical terms, this might for instance lead to a broader extension at LCW, among governmental (public) transitions stated in combination with private organisations, other projects in the Defence or MRO Industry. See also, ‘further implementations’ in Chapter 6.
4.4.4 Reliability: Operational Uniformity

The previous subparagraphs were mainly stated concerning the validity of this case study, but as mentioned at the start of this chapter, when the validity is guaranteed the quality should be considered over time. Therefore the ‘reliability’ of data and methodologies used has been reconsidered concerning a form of repetitiveness for the future. This for example includes the question whether the same or a different researcher would get the same answers and results in time, if he/she asks the same interview questions to the same persons under the same circumstances. Considering this we might think of a certain bias which negatively affects the reliability of the answers given by differences in (subjective/individual) personal feelings or matters which are relatively ungrounded and affected by emotion. For instance, the same people interviewed just before, during and after a large reorganisation as described in paragraph 2.3-2.4, might give different answers or even refuse to answer due to the fact that they are influenced by personal emotions since the individual position in a social group has been changed. Another example which might be important in this case, deals with group conformity, e.g. considering the hierarchical authority in military organisations representatives might give different answers when they are interviewed in or outside their operational setting or when they are among different colleagues or groups. Considering this according the in-depth interviews, particular names have been removed in order to guarantee the privacy of the respondents. Although this should be respected, it might decrease the operational repetitiveness of this case study. Considering another lack in relation to the repetitiveness of the in-depth interviews, a note should be made concerning the fact that none of the interviews used within this case study had been recorded. This choice has been made concerning the fact that particular respondents would appear uncomfortable due to the presences of a recording device and would therefore be biased in giving certain answers. In order to still guarantee the possibility to repeat certain procedures in the empirical field of interest, a data base of resources has been built. Note that all data kept in this data base is not directly allowed to be shared without prior approval.

In line with the descriptions given underlying the fact that the quality of the empirical investigations within this case study, the overall methodologies resources and instruments used, has been determined by means of the underlying validity and reliability of multiple sources of evidence as gathered within a particular period of time, the following paragraphs continue with an additional description of the actual collection of data, how the data collected has been processed and examined and how the final determination and justification of analysis and decisions has been made. The following paragraphs also involve a further reflection on the tests defined within this paragraph.

4.5 Data Collection LCW

In addition to the in-depth interviews as defined in the previous paragraph, several other sources of evidences were finally used in order to further underpin and strengthen particular insights and answers given. Therefore this paragraph continues with a description of the actual collection of data, this mainly involves a practical reflection on the aspects underlying the ‘construct validity’ as defined according the four tests mentioned in the previous paragraph.

As listed below, the sources of evidence of table 4.1 are verified with the perspectives, propositions and actual results of this research project. Before each source of evidence was individually linked to this project, two critical notes were made. First of all, participants have to be aware that information derived from this project needs to be treated as high confidential and should not be published without approval. Secondly, misinterpretation might have been caused by the fact that particular sources of evidence were translated from Dutch to English and reverse.
1. Documentation LCW

Documentation according the participation of LCW in public private partnerships has been used to introduce and sketch the context of the organisation. Additionally Governmental Policy documents have been used to further underpin the trends and backgrounds as described in Chapter 2. The quality of these documents has been limited by the documentations kept and allowed to be used at the organisation of interest. Other documents were used to strengthen particular notes made by respondents as described in source number 3.

2. Archival Records of individual participants at LCW

Archival records of particular individuals have been especially used in order to select and invite certain representatives according the project initiatives selected regarding the population as described within paragraph 4.3. To a certain extent, this could have biased the overall data collection phase, when personal records were incomplete. Therefore the actual representatives were actually selected in deliberation with Colonel Kaelen, PPP Project officer LCW.

3. Interviews related to the objectivity of this project

As mentioned within the previous paragraph several in depth interviews took place. Considering the results, 16 Representatives have finally been interviewed (face to face) to gather their visions. In general the participants were asked to cooperate in relation to their organisational position concerning the case study’s scope as defined in Chapter 2. It should be noted that the selection of the participants might have caused a particular bias in this research project, since this selection is limited by the participants’ availability and level of participation in respectively the organisation and projects of interest. Concerning the demographic aspects it should be noted that three out of sixteen respondents are representatives of private institutions. Other respondents are representatives of governmental (public) institutions, namely: Defence Materiel Organisation LCW, Dutch Ministry of Defence and Dutch Ministry of Economic Affairs. In general these participants were involved in the projects selected with reference to their status in the organisation. Most representatives are senior advisors or head of a certain department within the organisation.

4. Direct observations

Additionally several direct observations took place through the attendance in selected events and meetings. This contains for instance, general meetings according the daily activities of the participants in direct relation to the objective or context of this project, site tours/visits (Particular operational departments LCW in consultation with several senior experts), a symposium (PPP Kromhout) and conferences (WCM). Although the lessons learned according these activities were highly relevant in order to strengthen and reflect the initial perspectives described within Chapter 2, these activities were time consuming.

5. Participants observation

In contradiction with a ‘direct observation’, Yin (2003) described the ‘participant-observation’ as a special mode of observation, due to the fact the case study investigator is not merely a passive observer. Active participation of the observer within this case study has been discussed at the start to overcome a certain bias as caused by attendance of this observer, which might lead to a certain manipulation of the events selected. For instance, through asking and answering certain question within general meetings, the investor could have negatively biased the motivation of the selected participants, especially during the kick-off of certain project initiatives related to this case study’s scope.
6. Physical and cultural artifacts

Yin (2003) defined the final source of evidence as: a physical or cultural artifact. This has been less relevant in this case study, but should not be considered as superfluous. For instance, special office spaces reserved and demonstrably used as an ‘area of change or cross functional platform’ could have been used as evidence and might be directly observed through site visits. In line with this operational tools or instruments e.g. news letters sent, intranet, databases observable have been considered according this sources of evidence as well. Although these sources of evidence would be relevant, and offer particular insights, a certain weakness might have been caused due to the selectivity and availability of artifacts offered or observed.

4.6 Processing and Examining the Data Collected

Integrating multiple sources of evidence

Considering the overall construct validity and reliability in relation to the broad diversity in data obtained through the different sources of evidence as described within the previous paragraph, it is important to recognize that these multiple sources have been used in convergence ways (‘triangulating fashion’ (Yin, 2003; p14, p97-98) rather than applying to separate sub studies (see figure 4.2). This means that the data obtained has been integrated and linked according to the core topics/facts as discussed underlying each interview question as defined in line with the overall research question. This also resulted in a broader perspective of the original problems and scope described in Chapter 2.

![Figure 4.2 Convergence vs Non-convergence of Multiple sources of Evidence. (Adapted from Yin, 2003)](image)

As mentioned considering the definition of the reliability in a case study (see subparagraph 4.4.4) a data base had been created in order to guarantee the possibility to further investigate the underlying sources of evidence used within this case study over time. This mainly consist of: the documentation used/created (e.g. policy documents in pdf, reports, power points presentations), archival records (e.g. a list of contacts/respondents) and the results of the 16 in-depth interviews structured and tabulated.

Considering the question how the results of these multiple sources of evidence are finally analyzed, structured, described and discussed (See also, case study findings, Chapter 5 and discussion and conclusion Chapter 6) in order to give recommendations to LCW (Chapter 7), the following paragraph is used to further underpin the internal validity within this case study. Generally, this reflects the overall mutuality between: the causality within the in-depth-interviews, the initial perspectives and propositions stated in Chapter 2 and (management and scientific) literature findings described in Chapter 3 (for an overview, see figure 4.3).
4.7 Final Determination and Justification of Analysis and Decisions made

Whether a data analysis consists of examining, categorizing, tabulating, testing or otherwise recombining both quantitative and qualitative data evidence to address the initial propositions of a case study, analyzing will be especially difficult because the strategies and techniques have not been well defined (Yin, 2003). Yin argued that “familiarity with tools and manipulative techniques is helpful, but every case study should nevertheless strive to have a general analytical strategy-defining priorities for what to analyze and why”. In line with this, Yin (2003) formulated three strategies which are relying on: “theoretical propositions, setting up a framework based on rival explanations, and developing case descriptions”, to be used in practicing five specific techniques for case study analyses: pattern matching, explanation building, time series analysis, logic models, and cross-case synthesis (see Yin, 2003; p109). Considering these analytical techniques, three techniques might be emphasized in relation to the analysis and discussions made regarding the case study findings as stated in respectively Chapter 2, 5 and 6. Firstly, ‘Logic models’ deliberately stipulated a complex chain of events over time, and are staged in repeated cause-effect-cause-effect patterns, whereby a dependent variable (event) at an earlier state becomes the independent variable (causal event) for the next stage (Yin, 2003). Considering the ‘holistic and meaningful characteristics of real-life events’ as mentioned regarding the methodical characterization of a case study (see paragraph 4.2), the complexity arose from the fact that particular multiple stages exist over an extend period of time (e.g. a product life cycle). Although the use of logic models is also based on matching empirically observed events to theoretically predicted events, Yin (2003) argued that this technique may be considered to be another form of pattern matching. However, because of their sequential stages, logic models deserve to be distinguished as a separate analytical technique from pattern matching. ‘Pattern matching’, can therefore still be defined as the most desirable technique in analyzing case studies, since it reveals the comparisons made between empirically based patterns with predicted ones (or with several alternative predictions) and finally strengthen the internal validity (see also paragraph 4.4). ‘Explanation building’ can be defined as the third technique relevant to this case study. This technique might also be described as a special type of pattern matching (Yin, 2003). Especially considering the explanatory nature of a case study, the underlying phenomena are explained through stipulating presumed sets of causal links about it. Yin (2003) mentioned that this in most of the existing case studies resulted in ‘narrative’ form (story). For instance, according to Yin (2003; p120), critical insights into ‘public policy processes’ or ‘social science theory’ further reflected by causal links and defined as correct, can respectively lead to ‘recommendations for future policy actions’ and might be used or lead to ‘major contributions to theory building’. Although the narrative form underlying the explanation building technique might be defined as relevant, this approach is said to be ‘fraught’ with dangers as well. For example, investigators describing a case may slowly drift away from the original topic of interest. To overcome this problem, constant reference to the original purpose of inquiry, explaining possible alternatives, the use of a case study protocol, the establishment of a case study data base and the determination of a chain of evidence, has been considered.

Considering the fourth and fifth technique defined by Yin (2003), a ‘Time series analysis’ (based on experiments) would have been irrelevant for this case study and too time consuming. Although this case study involved several different initiatives (PPP Pilot LCW - DAS, MV and WCM(C) which could (or still might be) have been defined and studied as (more) separate case studies (‘cross-case synthesis’) by different investigators over time, the case study findings stated in Chapter 5 were obtained in convergence ways (see paragraph 4.6).

As a result, the discussions stated within Chapter 6 and the recommendations given in Chapter 7 are structured and dedicated to the comparison and overlap between the initial perspectives, internal propositions and core values of LCW stated in Chapter 2, the empirical case study findings as defined in Chapter 5, and the theoretical findings as described within the literature review, Chapter 3 (For an overview, see figure 4.3).
4.8 Reflection Case Study Methodologies

This chapter described the determination of the methodologies chosen according to the overall research project. Initially, this involved the definition and methodical characterization (applicability) of the case study approach by Yin (2003) (see paragraph 4.2), determined according to the underlying nature of overall research question stated as defined in Chapter 2.

In line with the methodical characterization of the case study approach, paragraph 4.3 defined the population chosen which referred to the long term initiatives as described in Chapter 2. In order to determine the quality of the empirical investigation, four test defined by Yin (2003) have been described in paragraph 4.4, respectively the “construct-, internal- and external validity and reliability”. Firstly, considering the ‘construct validity’ (Conceptual) a list of potential sources of evidence (Yin, 2003) has been stated in table 4.1 as applied and further discussed within paragraph 4.5 in order to define the actual data collection (mainly based on 16 in-depth interviews) at LCW. Secondly, the ‘internal validity’ (Causality) has been defined with special regard to the causalities and relationships among the interview questions stated (see figure 4.1) with regard to the overall scope of interest as defined within Chapter 2. Thirdly, the descriptions and examples given according the ‘external validity’ (Domain of interest) showed that the theories or overall perspectives used to lead or strengthen this case study, are the same theories or overall perspectives, which can be used to identify the underlying core aspects of other cases to which the results are generalizable. In other words, in order to broaden the extent of the external validity, scientific and management literature findings of specific/comparable areas of interest (Alliance research) described in Chapter 3 related to the propositions as initial perspectives stated in Chapter 2 according the contextual background and trends, can also be used to determine which and whether other (comparable) organisations might learn from and improve themselves through applying the lessons learned and recommendations given to LCW as described within this report. Although the overall validity of a case study has been considered according the latter tests, the quality had to be considered over time as well. Therefore a fourth test described was used to determine the ‘reliability’ of the data and methodologies used, with respect to the form of ‘repetitiveness’.
To further underpin and reflect the internal validity and reliability, paragraph 4.5 described that the multiple sources of evidence used (including 16 in-depth interviews) as described in paragraph 4.4 were integrated in convergence ways (see figure 4.2). Finally, paragraph 4.7 has been used to describe the determination and justification of the analysis and decisions made. Underlying this, three analytical techniques were emphasized among five major techniques stated by Yin (2003), namely: logic modelling, pattern matching and explanation building. Generally, this reflected how the discussions stated within Chapter 6 and the recommendations given in Chapter 7 were structured and dedicated to the comparison and overlap between the initial perspectives, internal propositions and core values of LCW stated in Chapter 2, the empirical case study findings as defined in Chapter 5, and the theoretical findings as described within the literature review, Chapter 3 (For an overview, see figure 4.3).

While reflecting these aspects and overall topics defined according the methodologies used within the overall research project or case study, particular suggestions might be considered for further investigation; therefore paragraph 6.5 is used to define different suggestions for further research. Chapter 5 continues with the descriptions of the exact case study findings. As mentioned before and shown in figure 4.3, these descriptions contain an overall distinction between the external and internal dependencies and risks. This distinction is explicitly based on the differences between perspective 1 and 2 as visualized in figure 2.1A-C. Therefore the descriptions given in Chapter 5 are further analysed and discussed in Chapter 6 according a ‘mutual’ perspective (see perspective 3: figure 2.1A-C). This discussion leads to a final determination of particular business alternatives and potential solutions integrated in the (concrete) recommendations in Chapter 7.
5 Case study findings

5.1 Introduction

The perceptions within this chapter derived after tabulating and analyzing the answers given with respect to the in-depth interviews discussed within Chapter 4. These perceptions are generally structured according to the combination of external and internal perspectives derived at the start (see also figure 2.1.A-C). In line with this, extensions are made pursuant to the internal causality (chronological order) underlying the sub questions stated within the in-depth interviews (see figure 4.1). The recommendations stated in Chapter 7 correspond with this underlying causality as well. A probability exists that the dependencies and risks might occur in the same order as described according the paragraphs within this chapter. The conclusions derived from this case study have been further discussed and strengthened within Chapter 6.

5.2 External Perceptions: Dependencies and Risks

5.2.1 Unequal Value Appropriation

According to LCWs’ position in an external network, the analysis suggests that managers at LCW should first of all be aware of national and international dependencies, which might indirectly influence an internal organisational process. For instance, managers are not always aware of the right incentives or balances between different levels of reasoning or interest between cooperating partners within a network. In line with this managers do not always consider the assumption that the collective form of interest within network collaboration should be higher than the natural form of interest concerning each participating public or private institution cooperating in a network. This might mean that unequal distributed partnerships in terms of risk and profit sharing could demolish the partnership itself when one of the partners is appropriating relatively more value above other(s) participating partners. Six out of sixteen respondents mentioned this risk in terms of: unequal distribution of risk, unequal financial investment and profits sharing. Considering this, the question arose, how to develop a mechanism (e.g. a fair risk reward model) which guarantees equal value appropriation overtime within and between different levels of collaboration in an external network.

5.2.2 OEM Licenses and Governmental Legislation

Considering the overall collective forms of interest stated above, managers should be aware that external dependencies and risks lead to a large complexity and restrictions. For example, Original Equipment manufacturers (OEM) should allow LCW to collaborate with other (potential) partners in the JSF network. This has been linked due to the security reasons and positional loss within networks. According this fact, managers do not always know whether they are allowed to cooperate with certain institutions which might indirectly affect other institutions within the JSF network, or not. For example, selling to or maintaining military equipment of others might directly or indirectly lead to an unforeseeable abuse. E.g. ‘reversed engineering’ of F16 or related components or modules sold to Israel has been described in this matter. This external dependency is therefore said to be affecting managers on operational level within the organisation as well. Initiators at LCW are not always sure whether they are allowed to actually start the partnership within an external network or not. Nine out of sixteen respondents mentioned uncertainty considering the fact whether they are allowed to implement particular investments in relation to the PPP, or not. This due to OEM’s licenses necessary to perform particular tasks in relation to their daily operational activities. Considering these dependencies and risks, governmental legislation formally related to the nature of the Defence Industry should be taken into account. Particular business partners are limited to cooperate and experience critical delays. Essentially, American lawmaking should be considered in line with OEM agreements, concerning strategic military equipment. Another comparable dependency has been given with respect to the National Government within the Netherlands. Six out of sixteen respondents mentioned the fact whether a public private partnership is allowed to be established, or not.
The latter has been defined concerning the national (Dutch) legislation or legal European Tender procedures. Mentioning governmental decision making processes, respondents not only referred to national, but to international political involvement as well. A question that could be considered is the fact whether regional or local political decision making has an impact as well. These political decision making processes might not only delay an operational process, it might also lead to a sudden demolition of an agreement. In line with the decision making processes, issues were mentioned as: delays concerning complex formation of legislation, internal bureaucracy on different and among institutional levels, morally and social governmental duties and resistance of the Ministry of Finance concerning financial risk taking. Five out of six respondents emphasized the fact that private partners might dissolve their agreement when particular activities are too often delayed cause of governmental decision making.

5.2.3 Loss of Strategic Information and Core Competences

Seven out of sixteen respondents considered the fact that strategic information might ‘leak out’ via (via) a partner institution within a network, as one of the most important external risks in combination with internal processing. Three respondents emphasized that not only strategic data should be considered, but also other strategic resources such as core capabilities, knowledge among people, expertise, skills and strategic tools. In line with this an example has been given concerning mismanagement of the Australian Ministry of Defence. In the past the Australian Ministry of Defence outsourced particular core activities or competences. Too much information concerning particular maintenance activities had been given away. Up to date the Australian Ministry of Defence is paying the ‘full price’ asked by private institutions since these institutions achieved a certain monopoly position, due to the fact that the Australian Ministry of Defence is not allowed or being able to revise and rearrange certain decisions made. Other examples are given concerning information as embedded among certain employees. Knowledge and expertise among people might be lost when participants decided or are enforced to make a change in their job activities (labour turnover). Strategic information might not only be lost, but might be appropriated by competitors or rivals when former employees join or become a member of these parties. So managers should be aware of the fact that ‘strategic vision’ will not be lost by to much focus on operational level. Although the focus of this research project is mainly related to the internal operation processes to successfully operate a partnership formed, managers should be aware of this mutuality as well.

5.3 Internal Perceptions: Dependencies and Risks

As mentioned earlier on, the focus of this case study is mainly related to the internal operational processes related to cooperation within an external network. Therefore many respondents emphasized particular issues concerning organisational change and its underlying social policies towards the effectuation of potential added value of network cooperation. Depending on each respondent’s background or proposition in the PPP at LCW, a complex array of answers could be defined.

5.3.1 Lack of Organisational Structure to Enhance Creativity

The former organisational structure at LCW, can be defined as a ‘splendid isolation’ (definition, Top Document LCW, Concept 2007) (see also subparagraph 2.4.1) or rigidly ‘old fashioned’ hierarchical system or structure, which is limited or closed by former organisational and social boundaries or dependencies as stated by top management. In line with this, managers should become aware of the fact how ‘former organisational settings and boundaries’ limit and disrupt new project initiatives, creations and process improvements as being available outside and within the current organisational setting. Therefore the suggestion might be given that managers should be aware of the structural differences between network configurations within and outside an internal organisation. For example, the underlying differences between open and closed networks are not clear in order to create or appropriate potential added value.
5.3.2 Social and Cultural Dependencies

The organisational and social boundaries or dependencies can be related to the organisational culture and human interaction. For example, issues as: organisational commitment, trust, fear and willingness among individuals and groups towards new or external initiatives, have been defined as the core problems in order to apply particular initiatives. Differences between governmental (public), military, and private institutional cultures have been mentioned to enforce this social or cultural impact as well.

‘Commitment’ has been defined (eleven of sixteen respondents) in terms of: the individuals’ willingness and need to participate and make efficient improvements, determination, readiness to participate and being involved in a changing environment. Remarkable is the fact that ‘organisational commitment’ has been defined as a problem with respect to higher and lower levels of participation in the entire Defence and governmental organisation. This cultural or social feature might be compared with a former (see 5.2.1) assumption stated: ‘the collective form of interest should be higher than the natural form of interest concerning each participating public or private institution cooperating in a network’. Considering this on individual or group level, a note might be made by stating that the individuals or groups need to participate should be higher than its natural needs or concerns.

‘Trust’ has been defined in general but can be described together with the reliability of partners (eight respondents) concerning the operation of particular tasks over time. Respondents mentioned that there might be a certain correlation between trust and a natural form of fear towards organisational changes (alternation), positional loss (conform the conditions of employment), assurance, responsibilities and freedom concerning a particular period of change. Considering a natural form of fear towards organisational alternation overtime, three respondents mentioned that especially particular employees of ‘the Old Guard’ might sabotage the operational alternation process towards a partnership since they are afraid of losing a former position. A remarkable note has been given by one respondent who mentioned that mutual trust can be seen as less important to a certain extent as soon as it is transformed in explicit definitions and stated in a contract or an agreement. This means that in case of a disagreement, partners can rely on former contracts or agreements made. In this way partners can still appropriate the additional value as explicitly defined in line with a partnership.

‘Budget versus Profit/Loss accounts’: a crucial aspect, explicitly mentioned by 6 out of 16 respondents in relation to the cultural background has been given in relation to financial accounting. In former settings public officers were enforced to deal with budgets instead of making their own profit/loss statements. They were not allowed to take their own responsibility according particular investments. The question that has been mentioned by the respondents considers the fact whether public officers will be able to make profit / loss statements or analyses if they have to.

‘National or regional traditions and habits’, cultural difference based on national or regional traditions and habits were only be mentioned by one respondent. Due to the persons proposition in the PPP of interest it might still be relevant to take a note of this cultural aspect and to think of the overall validity of this research project. For example this person underpinned the cultural aspect by mentioning that cultural difference would have a larger impact when the organisation of interest’s PPP was formed for example with an institution in Asia.

‘Defence versus industrial sectors’, four respondents explicitly emphasized the cultural difference between the Defence sector and the Civil Industry. A single respondent explicitly referred to the hierarchical ranking inside the military organisation. This person mentioned that this ranking system might cause a form of arrogance towards civilian participants representing private organisations.

Considering the latter definitions, a large amount of ‘social resistance’ can be derived, which exists towards new (internal and external) initiatives and creativity needed to change the former organisation. To a certain extent, the assumption can be made that ‘social resistance’ is based on former cultural backgrounds within or outside the former organisation, but the following subparagraphs show several other underlying issues which should be taken into account as well.
5.3.3 Lack of Accommodation and Capability

An internal aspect mentioned by only two respondents has been related to the internal selection of employees (key figures) to cooperate or to develop certain initiatives. Which has been underpinned by the possibility that certain problems might occur when the selected experiences the task as an extra workload besides the daily activities or oppositely when a person is working on a new initiative and gets constantly interrupted by employees dealing with their daily operational concerns. In this way certain long term initiatives cannot be developed correctly or are delayed by short term problems which are in line with the current or former business process. Remarkable is the fact that one of two respondents who emphasized this ‘lack of accommodation’ is also one out of three respondents of the private sector. Certain other forms of ‘lack of accommodation’ or temporary forms of extra workload or capacity required have been defined with respect to the availability of space, tools and resources needed overtime in order to successfully facilitate and effectuated (potential) collaborations. For example, temporary housing of external representatives or project teams has been described and leads to other problems in accommodation, availability and accessibility of (technical) resources. Especially the latter phrase, concerning temporary ‘accessibility’ has been emphasized by one of the three respondents who represent the private sector. The availability of well ‘qualified employees’ (especially technicians) has said to be a major problem as well. In line with this several representatives referred to the current developments in order to establish an ‘in house learning facility’, in order to overcome this lack of resource. In line with this human aspect, an incompatible acquirement policy has been defined as an internal risk as well. Especially the additional value of technicians (executives/ workers) is said to be strongly underestimated and underrated in the public sector of interest. With reference to the acquirement of capable employees the following risks have been mentioned: a tight labour market in relation to the industrial sectors of technology and/or Defence and the combination of a tight labour market with labour or staff turnover. Especially the latter can be seen as a crucial aspect, since this risk can be stated in line with a former (external) risk: the loss of strategic knowledge or expertise. Considering the capability of former or potential employees within the entire internal organisation, a ‘lack of capability’ has been defined (in terms of skills, expertise, tacit knowledge, competence, experience and absorption capacity). The following questions arose concerning the in-house capabilities of former employees in relation to the entire organisation; what ‘can’ actually be done by each participating institution? Is the organisation really capable enough to perform particular tasks? Are initiators able to mobilize the entire organisational processes in the right direction? Do employees have the right knowledge, skills or expertise to collaborate with external representatives and to overcome the organisational change or alternation?

5.3.4 Lack of Performance Measuring

While considering the active implementation of potential solutions and stimulants to overcome the former forms of risk as related to the internal organisational process defined in the previous paragraphs, one major problem arose: ‘the ability to measure performance or process outcomes’. This problem could not only be identified with respect to an organisational alternation or network cooperation, but with regard to former routines or processes as well.

All respondents mentioned that the successful operation is guaranteed as soon as the explicit objectives stated (e.g. in a mutual agreement or letter of intent (LOI)) are accomplished. Since particular objectives are defined in relation to an overall (relatively long) term, several respondents agreed that they are not aware, how to measure or determine ‘risk reduction’ or ‘successfulness’ in the meantime. In line with this, several respondents mentioned the necessity to explicitly state (sub) objectives in relation to realistic milestones or phases. A need for quantitative metrics has been emphasized as well. This has been underpinned by the relevancy and necessity of defining a ‘true zero or reference point’ together with explicitly stating a ‘range’ (Bandbreedte). Mutual agreements were said to be used/under construction to determine Key Performance Indicators (KPI) in quantitative terms concerning the process bottom line.
The complexity to determine the successfulness of social integration according creativity and potential business solutions or process outcomes has been mentioned. A ‘lack of human performance measuring’ has been described by referring to the fact that annual reviews are used to focus on individual satisfaction rather than individual performance outcomes. In line with this an interim performance evaluation has been described with respect to a person’s intuition or implicit point of view with regard to an alternation or cultural process. For example issues as ‘trust’, ‘creativity’ or ‘satisfaction’ might be related to a ‘soft core performance metric’. But the question that arose is how to explicitly measure these social aspects. Since the respondents mentioned that it might be difficult to quantify certain features, respondents preferred a qualitative approach based on personal feeling and intuition. For example, through determining participants commitment by analyzing the (positive or negative) nature of bottom up questions as accumulated among participants at operational level, by personal face to face conversations with those concerned, by asking direct questions about the participant’s feeling towards the objectives, by considering the nature of a labour dispute or conflict between two partners (in a network), by feelings considering the fact that partners start to hide or brush aside certain activities, intuition and feelings considering a certain tension or suspension on operational level. Two respondents emphasized their assumption that personnel officers should explicitly measure absenteeism among employees within an organisation corresponding the periods before, during and after an alternation process. One respondent (a senior personnel officer) expects a decrease of absenteeism during the period of alternation, followed by an increase in absenteeism after a period of alternation. By measuring the latter aspect, issues as trust and fear might somehow be predicted. Another comparable aspect defined in relation to social integration might be considered as well: ‘measuring labour turnover’. Three respondents mentioned a need for ‘psychological metrics or methodologies’ in order to determine personal satisfaction among participants. Periodical surveys and interviews were said to be relevant as well, when a focus is made on subjective rather than objective performance outcomes.

Although the answers stated above given with respect to performance measuring might sound quite obvious, the fact whether performance measures are really implemented or not could be further underpinned. Respondents argue that some former employees might fear performance outcomes, since these outcomes might indirectly lead to a loss of their personal position within the organisation. So they might take their advantage out of the fact that current performance metrics are ‘vague, dubious, invisible or unobservable’ and therefore lead to operational delay. To overcome this problem, managers should support participants to overcome this form of fear. Considering this, a link has been made to the current organisational structure, defined as the organisational hierarchy (see also 5.3.1), as controlled by governmental decision making and authorization from top management. Due to ‘differences in authority ranking’ employees might be afraid to share results and to discuss particular forms of performance outcomes, since this might limit their personal status and opportunities to be promoted. Another comparable example has been given according the visibility or transparency of results gathered according the financial accountability of budgets. To some extent participants might be able to introduce profit and loss accounts (see paragraph 5.3.2), but respondents mentioned that sharing particular results according profit might lead to a reduction in (annual) budget, since those savings or profits will not result in a direct allowance to further invest in potential business solutions for those departments who actually made the profit.

5.3.5 Feedback and Utilization of Performance Outcomes

In general, if performance outcomes are not enough available or observable due to the fact that they do not exist, cause of a lack in performance measuring (see 5.3.4), it will be hard to utilize and share these. Respondents agreed on the fact that this might negatively affect the usefulness of performance outcomes as input towards (other) process improvement initiatives. Considering this, references were made again with respect to former arguments stated in the sub paragraph 5.3.4: the assumption that employees are afraid to share particular performance outcomes. On the other hand several respondents mentioned that formal data will be shared already, but with regard to the wrong incentives and that this resulted in an overload of official reports and formal documentation as required due to KPI’s in the past.
Several respondents preferred an informal utilization of performance outcomes in the future, since they expected that too much formalization will lead to particular escalations in a negative form. Apart from this, informal utilization might stimulate the fact that initiators, top representatives and decision makers will be easier accessible for other participants. But the question mentioned is whether certain top representatives and decision makers will be open for performance outcomes from operational level, since this enforce them to come up with particular decisions which might lead to personal positional losses on a relatively longer period in time.

Apart from the fact whether performance outcomes will be utilized in a formal or informal way, respondents argued that transparency, visibility and openness towards participants should be stimulated in order to enhance creativity and willingness to be involved in the overall program or alternation process. From this point of view, an open minded setting should be stimulated, data sharing should be enhanced, resources should be made easier accessible and available for and among those who are authorized. So, in order to utilize the results and outcomes of organisational performance outcomes (if) measured, a need for relatively more feedback between and among representatives from different levels of operation (departments) can be identified.

5.4 Reflection Case Study Findings LCW

Considering an overall reflection of the former case study findings as derived after tabulating and analyzing the answers given with respect to the in-depth interviews discussed within Chapter 4, the following overall reflections could be derived:

External Perceptions: Dependencies and Risks

Although the focus of this case study is mainly related to the internal perspectives of LCW, in order to define how potential added value of cooperation in a network should be effectuated, several external risks and dependencies were defined considering the overall mutuality between the external and internal perspectives at LCW. In general the following external aspects were mentioned as critical towards internal processing and decision making. First of all, a collective form of interest has been defined in relation to ‘unequal value appropriation’ between partners within a network. Followed by a large complexity and restrictions mentioned with regard to OEM licensing and National/International governmental decision making.Apart from this ‘a strategic loss of information or core competences’ due to mismanagement at operational level within the internal organisation has been defined as well.

Internal Perceptions: Dependencies and Risks

Lack of organisational structure to enhance creativity

The former organisational structure at LCW, has been defined as a ‘splendid isolation’ (definition, see Top Document LCW, Concept 2007) or rigidly ‘old fashioned’ hierarchical system or structure, which is limited or closed by former organisational and social boundaries or dependencies as stated by top management. In line with this, several managers are not aware of the fact how ‘former organisational settings and boundaries’ limit and disrupt new project initiatives, creations and process improvements as being available outside and within the current organisational setting. Therefore the suggestion might be given that managers should be aware of the structural differences between network configurations within and outside an internal organisation.
Social and Cultural Dependencies

The organisational and social boundaries or dependencies have been related to the organisational culture and human interaction. Issues as: organisational commitment, trust, fear and willingness among individuals and groups towards new or external initiatives, have been defined as the core problems in order to apply particular initiatives at LCW. Differences between governmental (public), military, and private institutional cultures have been mentioned to enforce this social or cultural impact as well. Considering this, ‘social resistance’ can be defined as an overall problem towards the implementation or adaption of particular risks and opportunities stated in line with the effectuation of potential added value of cooperation in a network.

Lack of Accommodation and Capability

Certain lacks of accommodation have been defined with respect to the availability of space, tools and resources needed overtime in order to successfully facilitate and operate particular collaborations. The availability of well ‘qualified employees’ (especially technicians) has said to be a core problem as well. In line with this several representatives referred to the current developments in order to establish an ‘in house learning facility’, in order to overcome this lack of resource.

Lack of Performance Measuring

The organisational hierarchy, as controlled by governmental decision making and authorization from top management, conflicts with performance measuring systems ideal to creativity and process improvements of lower organisational levels. For example, unobvious results exist regarding ‘the reappearance of former mutual risks and business opportunities among a broad diversity of organisational processes, e.g. the lack of visibility in ‘profit and loss accounts’ limits the creation for new business opportunities.

Feedback and Utilization of Performance Outcomes

A need for relatively more feedback between and among representatives from different levels of operation (departments) can be identified, in order to utilize the results and outcomes of organisational performance as measured within the entire organisational system.

Mutuality: Combining External and Internal Perspectives

Three major perspectives derived at the start of this case study program. While the latter descriptions were mainly used in order to define the external and internal perspectives or the underlying core problems separately, Chapter 6 ‘conclusions and discussion’ starts with a summary/consideration based on a mutual perspective between the descriptions within Chapter 5. A requisition partly based on the literature findings stated within Chapter 3 is discussed to strengthen this perspective as well. This requisition is further underpinned by the recommendations given in Chapter 7.
6 Discussion and conclusions

6.1 Introduction

Considering the overall mutuality or coherence of the topics described within the previous chapters, this chapter involves the final discussion and conclusions made, in order to determine how potential value of cooperation in a network could be effectuated to benefit LCW’s own internal organisation. Accordingly, the descriptions stated within this chapter and the ultimate recommendations given in Chapter 7 are structured and dedicated to the comparison and overlap between the initial perspectives, internal propositions and core values of LCW stated in Chapter 2, the empirical case study findings as defined in Chapter 5, and the theoretical findings as described within Chapter 3.

As mentioned before, Chapter 4 has been used to describe the determination of the methodologies chosen according the overall research project to guarantee the quality of the overall findings and recommendations given, which also involved a final justification of the analysis and decisions made as stated within this chapter, see especially paragraph 4.7 (for an overview, see figure 4.3).

Those who are especially interested in the possibility to ‘generalize’ the case study findings to a larger extent or in the suggestions made for further investigation should pay extra attention to respectively paragraph 6.5 and 6.6.

6.2 Discussion

Chapter 2 described several trends and contextual backgrounds which affect LCW’s right to exist in combination with its changing responsibilities and core activities stated in line with the largest reorganisation in the history of the Dutch Military (see paragraph 2.3), stated inherently to and triggered by the end of the ‘Cold War’, the Dutch participation within the NATO and the formation of the European Union (see paragraph 2.2). Considering LCW’s changing responsibilities and core activities, LCW became aspired to develop a ‘Centre of Excellence’ for military & civil aircraft and helicopter engine maintenance in the Netherlands. Underlying this ambition, LCW stated the premise that “such an entity is needed to support future engine maintenance needs for the JSF aircraft once operational in the European theatre”. In general, this ambition has also been strengthened by a decrease in Defence budgeting in combination with the increasing importance, magnitude and complexity of MRO services of Capital Goods available for the ‘out-of-area operations’ the Dutch Military is participating in. Considering these changing consumer demands, LCW was enforced to review its internal perspectives and configurations (see paragraph 2.4).

In general terms, the considerations stated above contained two important backgrounds. First of all, the awareness of the trend that radical changes in (end) consumer demands result in new perspectives regarding the ‘entire’ product life time/cycle of Capital Goods within the Defence Industry. Secondly, the overall perspective regarding the ‘entire’ product life cycle/time, can be related to a continuous ‘Reductions in Defence Budgeting’ influenced by governmental decision making and changing ‘cost consciousness’ at top level. Combining both aspects, one overall perspective could be defined, which resulted in the following statement: ‘potential additional value can and should be obtained in order to develop a ‘Centre of Excellence’ by focusing on the entire ‘product life cycle’ costs of Capital Goods in combination with changing (end) consumer demands, rather than ‘only’ focusing on the purchasing and initial costs’. 
In order to overcome its changing responsibility and to benchmark, LCW became involved in several new initiatives which are strengthened by external partners in different industrial networks as described in respectively subparagraph 2.4.2-2.4.4. These initiatives were said to be important due to the increasing intensity of knowledge involved and shared as required to optimize LCW’s internal business processes and overall performance. Apart from this need, these initiatives should lead to new MRO business opportunities and strengthen LCW’s ability and rights to become more market oriented and optimize the ability to adapt external trends, risks and dependencies on Macro Level.

Although the initiatives based on LCW’s cooperation with external partners among different networks, sound quite opportunistic and might indeed lead to new possibilities, benchmarks and potential business solutions as required to enforce LCW’s changing core activities and ambition to develop a ‘Centre of Excellence’, representatives of LCW argued that these (Public-Private) initiatives do not guarantee any additional value as long as the internal organisational configuration of LCW will not be (further) optimized in order to effectively cooperate with external business partners. Considering this argument in line with the overall trends and LCW’s requirements described within Chapter 2, the overall question given according this research project had been stated in order to strengthen the internal perspectives at LCW. In line with these concerns, paragraph 2.5 showed that initially two different perspectives could be derived regarding the effectuation of potential added value through a collective form of operation (between Public and Private Partners):

- The first perspective relies on an internal optimization based on relatively clear objectives defined considering the functional interactions within a process chain determined according a well considered consumer demand,

- A second perspective can be defined considering relatively undefined functional dependencies and consumer needs within an external network which might result in new opportunities as well as risks.

Although the second perspective sounded as a potential which might offer the highest opportunities, a reference had been made to the argumentation that this potential could only be obtained if the internal organisational configuration of LCW was correctly optimized. So, this meant that as long as the internal organisation is not able to increase its own efficiencies, it will not even be able to effectively cooperate with external partners and create potential business solutions towards relatively undefined functional dependencies and consumer needs. Even if particular representatives of LCW would be able to create relatively higher potentials through cooperation with external partners, the question is, whether LCW would be able to actually appropriate the potential benefits to its own internal organisation. This again relies on a well optimized internal function which referred to the first perspective stated above. Considering this mutuality, the combination of perspective one and two has been defined as a third perspective. With respect to the ambitions of LCW defined in Chapter 2, a focus had been made on the third perspective. This mainly required a deeper understanding of the combination of several external and internal risks and dependencies as defined in Chapter 5. This combination will be further analysed and discussed within this chapter.

In order to guarantee the validity and reliability of the recommendations and answers given, the methodologies used within this case study have been described within Chapter 4. As noticed in Chapter 4 as well, scientific and management literature has been used to benchmark and strengthen the recommendations given within this case study. Accordingly, Chapter 3 contained a literature review, which is mainly dedicated to ‘Alliance literature’. Alliance literature namely contains 3 relevant levels of analysis similar to the required or underlying fields of interest integrated within the overall research question (see figure 3.1) respectively based on: a dyadic perspective, the firm level and the network level (Duijsters et al, 2004). Apart from the relevancy of these levels, paragraph 3.2 described that although the underlying formations, causalities and trends (see Chapter 2) in the Dutch Military might be defined as unique with special regard to the formation of relatively new collective forms of (network) operation at LCW, a comparable transition (an emerging paradigm of organisation) in other industries took already place in the course of the 1980s (De Man, 2004).
Paragraph 3.2 also described that companies aimed for an inter organisation form of co-operation which could be defined as a hybrid mechanism (based on quasi-integration (Porter, 1980)), since it moves between the extremes of a market mechanism and a hierarchical form of operation. This hybrid mechanism has been defined as an ‘alliance’ (De Man, 2004). Considering this in relation to the fact that LCW (together with its suppliers) had to become more market oriented or become more dedicated to the (end)- consumer of Capital Goods related (or its changing requirements and needs) rather than only focusing on a ‘splendid- isolated hierarchical setting as built considering the integration of one overall autarchic system related to the ‘Cold War’ system (see, paragraph 2.2), the current initiatives or inter firm co operations between LCW and its external partners studied (see, respectively subparagraph 2.4.2-2.4.4) are indeed used to move between the extremes of a market mechanism and a hierarchical form of operation.

Although this overlap sounds quite opportunistic while considering the relevance of alliance literature for this case study, it is also important to realize why and how several differences between the levels of analysis or corresponding streams of alliance literature have been defined. For instance, paragraph 3.4 described that the shift in alliance research, towards the firm specific or intra organisational antecedents (e.g. processes and mechanisms) underlying a successful realization of inter firm cooperation (De Man, 2005), occurred due to the fact that the dyadic view on inter firm cooperation (see paragraph 3.3) resulted in several relevant perspectives showing the fixed effects ‘why’ particular alliances failed, but did not increase the understanding of the question ‘how’ firms could increase their alliance success in general (Ireland, Hitt and Vaidyanath, 2002; Heimeriks, 2004). Considering this in relation to the overall research question stated in Chapter 2, it is indeed important to not only focus on the fact why particular initiatives at LCW related to the inter firm co-operation in a network would fail in terms of risk, mutual dependency and value appropriation, but also to consider how the internal alliance processes should successfully be managed and stimulate creativity towards the formation of new business opportunities which are functional to the end consumer demands and its changing requirements and needs. In a more practical sense, this means that managers at LCW should not only focus on issues as: the formation of ‘open-ended’ contracts, trust, (relational and performance) risk, partner fit and symmetry, commitment and complementarities between partners (see paragraph 3.3), but they should also (re-) consider and continuously identify issues underlying the organisational structures, its routines and management processes, the organisation specific (cap)abilities and considerations concerning the exchange of knowledge, information, expertise and creativity (see also paragraph 3.4) in order to determine and enhance the performance rate of an inter firm cooperation between Public and/or Private partners in an industrial network.

Accordingly, these topics could/can be further compared with the case study findings as stated in Chapter 5. For instance, the external perceptions in paragraph 5.2 described the major dependencies and risks related to the internal process activities defined with respect to: equality in value appropriation between partners, OEM licenses and governmental legislation, and the loss of strategic information and core competences, might especially be related to the inter-firm level of alliance research (on a dyadic perspective), while the topics described in paragraph 5.3 should rather be defined as the intra firm antecedents affecting the overall performance of an inter firm cooperation between the public and/or private partners. Although topics as ‘commitment, trust vs. fear, willingness’ are defined in line with the internal perspectives, and mainly represent the attitude of the internal representatives, these topics should continuously be deliberated on different levels of application over time, not only with respect to the external partners or the entire form of inter firm cooperation, but also with regard to the individuals participating in an internal process or form of alternation. This might sound opportunistic, but considering the difference in alliance literature, the following premise could be considered: ‘building trust or having more commitment can only be seen as a factor (or side condition) which overcomes the fact that a partnership will not fail or be delayed by ‘social resistance’ or cultural differences between individuals or groups, but it does not guarantee any additional value’. On the other hand, topics stated considering the need to develop profit/loss accounts are really required to determine the amount of additional value obtained though an inter firm cooperation. Considering this, the topics stated according the internal lack of accommodation (temporary forms of capacity or extra workload required/ available) and capabilities could especially
be related to the internal antecedents or alliance capabilities as described in paragraph 3.3 in order to further strengthen the recommendations given in Chapter 7. For instance, the topics stated in respectively figure 3.2 and 3.3 have been integrated. Especially the need to develop and determine the levels of knowledge and expertise shared and available in order to successfully manage and create new opportunities is remarkable and should therefore continuously be reconsidered. For example, managers should enhance participants to evaluate their actions in order to learn and to determine their shortcomings in terms of skills, expertise, tacit knowledge, competences, experiences and their capacity to absorb new knowledge, risk or dependencies.

Although the latter sounds opportunistic as well, it is noticeable that one major problem arose while considering the active implementation of potential solutions and stimulants: ‘the ability to measure performance or process outcomes’. This problem could not only be identified with respect to an organisational alternation or inter firm cooperation, but with regard to former routines or processes as well (see also subparagraph 5.3.4 and 5.3.5). Although the answers given with respect to performance measuring sounded quite obvious, the fact whether performance measures were really implemented or not, has been further underpinned by the arguments stating that some former employees might fear performance outcomes, since these outcomes might indirectly lead to a loss of their personal position within the organisation. So they might take their advantage out of the fact that current performance metrics are ‘vague, dubious, invisible or unobservable’ and therefore lead to operational delay. To overcome this problem, managers should support participants to overcome this form of fear. Considering this, a link has been made to the current organisational structure, defined as the organisational hierarchy, as controlled by governmental decision making and authorization from top management. Due to ‘differences in authority ranking’ employees might be afraid to share results and discuss particular forms of performance outcomes, since this might limit their personal status and opportunities to grow within the organisation. Another comparable example has been given according the visibility or transparency of results gathered according the financial accountability of budgets. To some extent participants might be able to introduce profit and loss accounts (see also paragraph 5.3.2), but respondents mentioned that sharing particular results according profit might lead to a reduction in (annual) budget, since those savings or profits will not result in a direct allowance to further invest in potential business solutions for those departments who actually made the profit.

In order to give recommendations regarding the lack of performance measuring, the literature findings dedicated to ‘performance metrics and mutual reflection’ stated in subparagraph 3.4.7 could especially be used. In line with the latter it became clear that if performance outcomes are not enough available or observable due to the fact that they do not exist cause of a lack in performance measuring, it will be hard to utilize and share these (see subparagraph 5.3.5). Respondents agreed on the fact that this might negatively affect the usefulness of performance outcomes as input towards (other) process improvement initiatives. In line with this, the respondents argued again that transparency, visibility, openness and feedback towards participants should be stimulated in order to enhance creativity and willingness to be involved in the overall program or alternation process. From this point of view, an open minded setting should be stimulated, data sharing should be enhanced, resources should be made easier accessible and available for and among those who are authorized. So, in order to utilize the results and outcomes of organisational performance outcomes (if) measured, a need for relatively more feedback between and among representatives from different levels of operation (departments) could be identified. As mentioned in subparagraph 3.4.8, in order to stimulate reflections and performance outcomes, individuals might have to be rewarded or punished with respect to the (sub) objectives stated within a performance metric. In order to develop and underpin the need for certain reward systems, literature on organisational behaviour and human performance management became relevant. Considering this, especially the recognition of intrinsic and extrinsic forms of motivation to collaborate might be important.
6.3 Final Reflection

After reflecting the former topics described within this chapter in order to develop several overall perspectives, the following arguments could be made: ‘according the functional or complementary needs within and outside the organisational networks of LCW, an alternative management approach needs to be adapted within the current ‘hierarchical setting’ within LCW in order to stimulate creativity needed to manage potential risks and business opportunities’. This management approach should be used to focus on the mutuality or interaction between the external and internal risks and opportunities.

Considering the selection and implementation of an alternative management approach, the organisational system or structure might require a ‘structural hole network’ (see subparagraph 3.4.6, Walter et al; 2007). A ‘structural hole network’ exists of a closed system, consisting of open (sub) components (holes/gaps) which should be (re) defined as functional or complementary potentials to the overall system itself. For instance, the entire organisational building should be closed to protect its internal settings, but particular departments within this building should be left open, visible and ordered according to a transparent setting, in order to be recognized and understood by all participants who might share potential added value. Considering the protection of other functional components within the organisational system, ‘bridge’ functions (e.g. window approach) should be created between these internal ‘holes/gaps’ and the external environment of the overall system. In order to balance between these open and closed forms of interaction, one internal management approach (open organisational learning) is required to manage and qualify the social and cultural dependencies underlying the (cap) abilities needed and to full fill a structural hole in order to effectuate potential added value of cooperation in this network.

Additionally, a long term (strategic) perspective or vision should also be considered to predict relatively undefined functional dependencies and consumer needs within and outside an external network or industry. This, for instance, involves the question, how potential alliance opportunities will occur due to the fact that partners are via-via (indirectly) informed of other partners’ reputations embedded in or outside their former network boundaries (see paragraph 3.5). As mentioned in paragraph 3.5, examples are given considering the economical profits of the JSF program in terms of spin-offs and spill-over effects an actor in an industrial network might realize. Considering the potential business opportunities for other industries or markets, this again reflects the importance of the fact that the Dutch Ministry of Economic Affairs has been involved in the current developments at LCW as described in Chapter 2.

In abstract terms, the following can be concluded:

- First of all, one management approach should be applied in order to re-structure a former rigidly ‘old fashioned’ hierarchical system within the internal organisation, since this is currently limiting and disrupting organisational creativity, needed to benefit the internal organisation and LCW’s ambition to develop a ‘Centre of Excellence’ for military & civil aircraft and helicopter engine maintenance in the Netherlands. In line with this, openness, transparency and visibility are suggested as the core aspects in order to create and implement new product and/or process improvements as gathered outside the former configuration.

- Secondly, this management approach should facilitate the ability to adapt external dependencies and risks. In line with this it is still important to protect, keep and close particular formations as stated in line with long term strategic directions of the overall Ministry of Defence.

- Thirdly (additionally), a long term (strategic) perspective or vision should be considered to predict relatively undefined functional dependencies and consumer needs within and outside an external network or industry.
Combining these conclusions, one management approach should be applied with respect to an open as well as closed form of interaction, within and outside the organisational configuration. In line with this, managers should be able to benefit from, reject and control new or former limitations of human interaction and social or cultural dependency as formed underlying one overall management approach.

### 6.4 Further Implementation and ‘generalization’

Considering the need for concrete recommendations, Chapter 7 is used to describe several examples of potential implementations and stimulants which are mainly ordered according the internal concerns stated in Chapter 5.

Although the aim of the case study, the descriptions and recommendations given are directly related to LCW, other (comparable) organisations, groups and individuals might learn from and adapt particular underlying facts, theories and experiences described according this case as well. For instance, as already mentioned in subparagraph 4.4.3 with regard to the ‘external validity’ (Domain of interest) or possibility to generalize particular case study findings beyond the immediate case study, findings and lessons learned from this case study might be relevant and for instance be integrated in other initiatives based on the mutuality within the underlying principles of switching between a “market mechanism and a hierarchical form of operation” as described according inter firm forms of co-operation e.g. Alliances Research (see paragraph 3.2) or PPP. So, to a certain extent, it does not ‘really’ matter whether an overall transition is related to a Public or Private institute, or whether the transition and trends evolve through certain anomalies, risks, rapidly changing (end) consumer demands or purposefully planned overall opportunities based on visions and clear perspectives by individuals who voluntary participate to improve their products and processes to be first in the market place, participants have to cooperate with others anyhow. Especially when we consider the increasing impact and frequency of the latest technologies involved and how the underlying initiatives are based on inter firm co-operations and tighter product and process integrations based on a high intensity and level of complementary knowledge and expertise. In line with this, the lessons learned and defined according this case study are especially relevant for those who recognized that new product and process development should be orchestrated with a special focus on the entire product/process life cycle as defined in line with a functional demand determined in cooperation with the end-consumer. In more practical terms, these considerations were already integrated in this case study. For instance the arguments given according the need and opportunities (e.g. technical spinoffs and spillovers) to involve representatives of the Dutch Ministry of Economic Affairs within the overall processes reflect the possibility to generalize certain outcomes. Also the broad diversity of different MRO organisations integrated in a WCM initiative (see subparagraph 2.4.4) to learn from each other and to develop new concepts and mutual opportunities, can be emphasized and used as an obvious example towards the external validity.

Whether this might sound opportunistic or not, others should realize as well that there are always certain pitfalls and differences. For instance, the recommendations given in Chapter 7 are tailored solution/concrete recommendations and should not be directly implemented elsewhere. E.g. the changing need for ‘real’ profit and loss accounts is relevant for particular Public representatives only, since Private institutes are already able to collect their own insights in cost and invest in it. Or another example, ‘social resistance’ between private and public institutes might be especially different, e.g. participants in private organisations might have to be rewarded by focusing relatively more on their extrinsic (e.g. money) rather than intrinsic (e.g. social attitudes inherently related to a function or task itself) motivations. So the overall steps in Chapter 7 (as integrated in the subtitles) might somehow be generally applicable in many situations, there are concrete differences in the implementation as well.
6.5 Suggestions for Further Investigation

Considering the overall methodologies used with this case study, or especially the methodologies which were excluded in particular (see Chapter 4), more research might be relevant. As already mentioned at the introduction of this report, this case focused on inter firm forms of co-operation, internal organisational aspects and networks, and became especially interesting cause of the underlying backgrounds, trends and extension, the underlying diversity and intensity of high technologies and knowledge involved, the social and cultural backgrounds, perspectives and complexities based on a wide diversity of different representatives of different nations/(inter) nationalities, industrial sectors and professions. Furthermore this case study is especially relevant from scientific perspective since it both reflects Public as well as Private forms of Partnerships. This due to a lack of scientific literature published regarding Public / and Public-Private forms of inter firm co-operation. Regarding these arguments this paragraph is used to define several suggestions for further research.

First of all, different investigators could be asked to participate since they might come up with different insights and opportunities, since each individual is always biased by former perspectives and attitudes based on subjective experiences, different evolutions overtime and the possibility to gather different resources available. Considering this, the topics defined according each particular overall conclusion or according the recommendations given might also be defined as separate fields of interest. For instance, another researcher might focus relatively more on the external concerns within the entire industrial network(s) in which LCW is participating in. This might especially be relevant, since this case study was related to the mutuality between the internal and external perspectives (see paragraph 2.5) by starting from an intra organisational perspective. Regarding the third overall conclusion, others could even focus on the long term (strategic) perspectives and visions which should be considered to predict relatively undefined functional dependencies and consumer needs within and outside an external network or industry. For instance, these researchers should focus on a broader vision regarding potential technologies, product and process improvements/ innovations related to the spin offs and spill over effects mentioned according the High Tech Technologies involved in the Dutch Defence and MRO Industry.

Different forms of investigations and sources of evidence might be considered over time to strengthen the construct validity according to their underlying nature. For instance, an overall (site) survey (among the entire organisation) might be taken into account which is partially based on a quantitative approach, related to the qualitative ‘factors’ derived within this case study. Partially, in a sense that respondents should also be able and allowed to describe certain insights by giving open answers. By doing this participants will also become able to give their opinion and feel comfortable with the fact that they are involved in certain processes. Managers should make sure that the final outcomes related should be published as well in order to overcome the fact that respondents will lack a certain enthusiasm towards other forms of investigation in the future.

Different independent researchers might also be asked to further focus on a particular or group of recommendations given in Chapter 7. Considering this, they should also take the literature findings stated in Chapter 3 into further account. For example, one particular researcher might focus on ‘performance metrics implemented’ (see paragraph 7.4), while considering a further focus on and relevancy of the literature findings stated in subparagraph 3.4.7. This might especially be relevant in the future, since the internal concerns stated in this report lack a certain form of evidence due to the fact that LCW has not really implemented such metrics in general. For example researchers might further focus on the fact how the implementation of real ‘profit and loss accounts’ and/or ‘competence based management’ finally influenced the fact how the entire organisational, group and individual performances are measured over time.
Considering different forms of investigations, experiments might for example be taken into account. For instance, 2 or more groups based on similar or different formations might have to be asked to achieve the same objective within the same time span. In line with this the differences, overlap and mutuality should be studied, e.g. to determine particular forms of creativity, courage, commitment, willingness and the ability of a group/individual to perform successfully. Although this might be time consuming, it might be relevant to understand the differences and overlaps between particular groups and individuals, which again might enforce the perspectives of social behavior and human attitudes, especially regarding the differences between routine processes, activities related to organisational forms of alternation and inter firm cooperation. Considering the overall gap on public-private literature, it might be especially relevant to execute these experiments according the social differences and overlaps between group formations which are purposefully selected according this nature. This might also be relevant in practice, e.g. to determine whether and why particular functions or competences should be performed by Military or Civil representatives or not, or to determine whether and why particular/former functions can be/ should be taken over by private partners.

Investigations might furthermore be applied regarding a broader extent while implementing different recommendations, in specific or different ways or functionalities, among different or similar levels the internal or external organisation, networks, markets to strengthen the (external) validity of the descriptions and recommendations given. For instance, it might be interesting to study other PPP initiatives at LCW or organizations related in the MRO market (e.g. participating in WCM). This might be especially relevant, considering the overall perspectives mentioned with respect to the increasing need to focus on different perspectives of Capital Goods as triggered by new forms of ‘cost consciousness’ and the increasing intensity of knowledge and High Tech Technologies involved.

Reconsidering the internal validity and reliability of certain outcomes, specific investigations overtime might be considered according particular/ equal time series, time spans, overall trends, overall phases and entire life cycles defined according particular process and product developments, e.g. periods of implementation, acquisition or demolition of the F16 and a replaceable ‘instrument’. For instance, considering the public nature underlying this case study, researchers might investigate how particular decisions are made between different periods of (national/international) elections. They should consider whether, how and why particular (political) decision makers or key persons act differently and how this indirectly and finally affects the entire ambitions and right to exist of LCW in general.

Although these suggestions might be relevant, managers at LCW should take note of the considerations stated in paragraph 7.7 as well!
7 Recommendations to LCW

7.1 Introduction

Considering the conclusions stated in line with the overall discussion and reflection of this case study, (see Chapter 6) the following recommendations are stated in order to effectuate potential added value of cooperation in a network as needed to benefit the own internal organisation of LCW. These recommendations are described according to the internal causality underlying the overall problems and transitions as described in Chapter 2 and should therefore be especially (‘re’-) effectuated pursuant to the internal dependencies and risks as inherently ordered with respect to the general perceptions and reflections stated in Chapter 5. As mentioned earlier on these recommendations are strengthened by the literature findings in ‘Alliance Research’ described in Chapter 3. See also ‘Research Methodology’, Chapter 4.

7.2 Integrating ‘Structural ‘Hole’ Networks’ and supporting ‘Open Organisational learning’ to enhance Creativity and Innovation

In general terms ‘Open organisational learning’ should be supported among different levels within or outside a ‘structural hole network’ in order to effectuate potential added value, needed to (re)-fill the functional or complementary ‘holes’ as defined according to the organisational needs and objectives in the overall system. The position and additional value of former employees and their interactions within and outside a current organisational setting should therefore be reconsidered as well. In line with this, managers should be aware of another’s’ dependencies, needs, willingness, fears and (cap) abilities to (co)operate with internal as well as external representatives.

In practise this should for instance mean that the former boundaries between particular areas, departments and systems should be further reduced. This means that the processes and configurations stated according the current departments (see subparagraph 2.4.1) should even be further integrated in order to become easier accessible for the internal representatives and those who represent a partner’s institution. This for instance might mean that particular processes and tasks which currently belong to the Staff, Account Management, Technology, and Logistics should be further considered, integrated, centralized or decentralized in particular moments in time, especially when consumer demands are changing rapidly as sketched within Chapter 2 according the overall transitions in the Dutch Military and changing positions as described in line with the political environments and out of era operations. This for instance might mean that the current departments/offices which are spread all over the (AFB) place should be accommodated in one building with interchangeable areas and open spaces/offices, which are accessible or/ and lockable for those who are (un)authorized. In line with this an ‘open’ area/department/office/platforms/atrium should be recognized and accommodated with respect to new forms of inter firm co-operations (Alliance department). This area should become clearly visible and accessible for those who are in-between the internal and external organisation/ different departments. This might somehow be described by a ‘window approach’ or ‘bridge function’. (By doing this, particular sights become visible (structural open) to stimulate creativity while other areas are still protected (structural closed) in relation to the former routines stated directly in line with the out-of-area operations the Dutch Military is participating in). Frequently invite internal as well as external key persons to visit this ‘alliance department’ to demonstrate the currents strengths and in-house capabilities, but also the functional weaknesses, shortcomings, incompatibles and risks. Consider the fact that this should not always be done in a too formal fashion! Creativity will not have to be reached between 8 am and 5pm! While these visits take place, certain dialogues should be supported, rhetorical questions should be stimulated, visitors must feel comfortable and have time to ask questions about particular requirements or opportunities. This might sounds opportunistic, but it might be hard to realize, when particular internal representatitives are not willing to learn new alternatives and continuously limit these forms of creativity or just reject (in arrogant manner) these dialogues and solutions through referring back to the need for the current configurations, attitudes and habits,
without even considering a change on Macro or Meso level. Considering this, P&O managers in particular, due to their profession, should further identify the underlying reasons and personal needs, why particular individuals are not willing to change, fear and lack certain forms of commitment with regard to these external initiatives (see also ‘social resistance’ paragraph 7.4).

All considerations above should be reconsidered in line with an overall perspective on the entire product life cycle as required in line with the former transitions (see Chapter 2). This means that account managers should not only focus on the initial costs, but on the MRO costs over the entire life cycle as well, which means that they should be able to have clear insights in the other departments within the internal organisation and they should even achieve tighter process and product integrations with the current and new suppliers. To implement this, managers should plan different scenario’s, consider new alternatives while focussing on these changing consumer demands. This even means that internal managers should consider and make particular investments and creative offerings/solutions for external partners (suppliers, customers and end-consumers) on the short term, to finally achieve relatively higher collective profits on the long term. This should be done by group sessions, in an area or totally different setting where the participants will not be disturbed by their daily processes and concerns as related to former or current routines and procedures. This should again not always be done in a too formal fashion, but in an informal manner in order to stimulate creativity and define new alternatives and innovative solutions. Considering an informal session, participants should be selected in cross functional manner (from different departments and organisational levels among the internal as well as partner organisation) or asked to voluntary cooperate and discuss their ideas. This selection might for instance be applied with special regard to the identification of the largest costs or budget owners or most influential suppliers as defined in line with former routines and process chains, but considering an alternative approach, managers might have to think first about the fact how a process chain can be changed in a functional way (functional, again! With respect to the overall life cycle! Rather than initial cost perspectives). In this manner, unforeseeable alternatives brought into practise by relatively small suppliers (in different terms) might still result in relatively large process or product improvements. This means for instance that the PPP Pilot between LCW and DAS or new PPP Pilots should not only be used to focus on the possibility to achieve more orders to maintain relatively more F16 engines, but also to find alternatives to integrate better alternatives through focussing on product and process improvements by tighter integrations of the current or new suppliers.

To become more flexible and (cap) able to rapidly change particular thoughts, achieve new insights and improve the organisational configurations over time, change routines, processes and procedures stated according a former hierarchical setting of this military or public organisation should be reconsidered. For instance, profit and loss accounts should really become a norm rather than the current forms of annual budgeting. Although this sounds opportunistic, the right knowledge, expertise and tools should be accommodated, shared and adapted by those who will become responsible for this. On the other hand managers should realize that sharing particular profits and losses might also have some negative effects (e.g. in line with the out of area operations, or positional losses, reduction on annual reserves). Considering this, the accounts should somehow be structured according the same principles as considered according the considerations made in order to integrated former departments in one building. For instance, open book accounts, should be supported and accessible for those area’s or representatives which are somehow planned to be integrated. This should not only be considered among the departments within the own organisation, but also in relation to the external initiatives and partnerships. Although this might sounds risk full, managers should focus on the mutual benefits and collective forms of interest stated in line with the need to define compatible solutions for the end-consumer. Considering this with regard to the descriptions stated in Chapter 5, this includes the need to further focus on trust, commitment and new forms of legislation and the protection of intellectual property rights.
How opportunistic or tactful these recommendations might sound, managers should really take action and communicate these thoughts among the entire (own) organisation(s). Although this sounds again quite ‘simple’, the case study findings in Chapter 5 as well as the literature findings in Alliance research (Chapter 3) show that there is still a common lack in knowledge management. Considering this, the following paragraph will continue with several concrete recommendations and examples how managers should become more capable and learn to take more responsibility in relatively new forms of cooperation, how they should support and share their and someone’s others ideas and experience in order to successfully accommodate or effectuate new alternatives and creativity among different organisational levels.

7.3 Becoming (Cap) able to Support and Accommodate Creativity and Leadership through Open Communication, Visibility and Responsibility Taking towards Internal and External (Mutual) Initiatives

In order to stimulate the effectuation of the first group of recommendations among the entire organisation or its (sub) departments, the following is recommended: ‘Open communication and visibility’ and ‘responsibility taking’ should be supported, among individuals in order to share and adapt external initiatives needed, to become aware of the cultural and social backgrounds underlying another’s reasoning to (co)operate. In line with this, individual employees or groups should be enhanced to ‘unlearn or reject former incompatible configurations’. This means again that former organisational/departmental boundaries, limitations, restrictions should be removed or extended in order to accommodate external initiatives. For instance, departments or internal workspaces should be ‘simply’ cleaned or tidied up to create open areas, free space or accommodation necessary to become visible and transparent. Although this might sound quite ‘simple’, it still involves a certain discipline and responsibility. This might be quite obvious in areas which are directly visible and easy accessible, but the same principles should also be related to knowledge intensive systems integrated in the overall organisational configurations. For instances, structural configurations might be(come) obviously clear in and easy improvable in workspaces where employees maintain and repair products and tools directly related to the F16 engine, while structural configurations in planning or communications systems are: not up-to date, incompatible or even lack a certain visibility needed to identify particular pitfalls, adapt and share critical information in line with routine processes, internal project initiatives and partnerships to create innovative solutions as required in line with the overall transition described in Chapter 2. For instance, a digital instrument like an ERP- system, should be structured and kept up to date according the structural requirements and changes of the overall organisation, as defined above in paragraph 7.2. This requires that the organisational structure should be clearly defined and understood before an ERP system can actually be successfully integrated. This again reflects the need to open-up and lock particular parts/compatible components of such a digital system for those partners who need particular insights and information to co-operate and to identify certain pitfalls and opportunities to be improved and effectuated. Another example can be used, which is quite obvious and easy to use to explain others to share data to enhance co-operation, is the fact how representatives share their agenda’s in Outlook. If a person authorizes others to have certain insights in an agenda, task might be easier planned. Although this sounds quite simple, individuals might refuse to do this, since they lose a certain ‘liberty’ in their daily activities and often reject this alternative in terms of privacy and safety reasons with regard to different military settings.
Considering these concerns, managers should stimulate, learn to take more responsibility towards creativity and cooperation with internal as well as external representatives. In general terms, leadership should simply be enhanced. For instance, real face-to-face interactions should be stimulated among key figures. This also includes the fact that top-management should pay more attention and interest in different cross functional areas. These top-managers should more frequently visit workspaces and operational areas, ask for and pay more attention to bottom-up questions (in a formal as well as informal setting), they should communicate more functional requirements rather than concrete specifications. Managers should state critical and rhetorical questions among different departments about long term perspectives in an overall or mutual perspective as related to the overall ambitions and vision of the entire organisation. This should be repeated over time, to build trust and to stimulate self-esteem and development of all individuals within the entire organisation or within a partner organisation. Considering the latter in an early project phase or even before an initiative is put into process, participants which were asked to give their opinion might even more enthusiastic and willing to cooperate and commit in a later stage of implementation. These visits or meetings should be done randomly, especially during or just outside the actual operations. For instance, particular individuals might give different answers or come up with different alternatives, if they can speak freely without being interrupted by other colleagues or supervisors, in a sense that they will be embarrassed in a later stage by the same colleagues, due to the fact that the person actually revealed particular incompatibilities. This leads to an actual change and extra work or efforts required which might negatively affect a personal position and status. So, in each stage of alternation, people should consider whether and why they and/or others refuse to share particular data and how this can be solved with regard to the individual position of those in charge.

Although it might be useful to support and teach particular representatives to become more creative and be able to cooperate and lead new initiatives, the selection of new leaders might have to be considered as well. For example, new leaders should be selected by focusing on the required competences and capabilities, rather than selecting those who are ‘the next to be promoted cause of military ranking’. This should be taken into account to overcome the fact that the right persons with the right competences, capabilities and expertise (e.g. technical expert) might become relatively bad leaders or managers, while a lack of compatible experts will be created in the mean time. This again requires new selections; new training programs and again increases the cost of operation in general. This again reflects the need to have a clear vision on the functionality of P&O representatives and how they should operate, select new employees and how they evaluate the additional value of each organisational member over time. Considering this in general with regard to the topics described in Chapter 2, P&O representatives should really understand the overall perspective as well. They should understand how the entire transition is changing the fact that particular tasks will not have to be carried out by military functions anymore. This really affects their overall and current policies towards the selections of new employees in general. On the other hand, this might even mean that they should take their responsibility to consider whether current employees, do still have the right capabilities or are able to adapt the functional requirements in the future. Although this might be in conflict with personal positions and social relations, it requires an objective and critical approach to be deterministic and really fire or replace those who do not match with the changing requirements.

Considering the fact that the effectuation of particular initiatives is not only related to social interaction, the latter principle can also be related to the resources, tools and instruments available. For instance, if particular workplaces require and actually have been accommodated with the right instruments and tools, managers should take the responsibility to get rid of former materials after the new materials have been successfully integrated and adapted in the operational process. So in the first instance, employees should have enough time to learn and adapt new alternatives, which for instance means that these instruments have to be used in parallel for a while. But finally former equipment, instruments or materials have to be taken out, before the employees start to fall back in former attitudes and start using these former goods again. This again results in the fact that foreseeable improvements will not even be reached as planned and might even lead to a larger frustration and ‘social resistance’ which again negatively affects creativity and process improvement. To overcome this, managers might have to be clear, define and inform participants why particular changes are made
and how these relate to the overall transition which is taking place. Again this form of communication can be done by standard procedures, but the question is whether these were already effective, are up to date, or whether alternative forms of communication should be created which are more effective. For instance new types of communication might be considered in parallel, e.g. a digital forum/network, Facebook, Twitter, Hyves (already in use for the Dutch Military), digital newsletters (including photos and simple drawings, rather than boring texts only!). Especially the latter might be used in parallel within the internal and external organisation since this can be easily implemented, while the other examples require new investments and might increase the cost of operation on the short term. Considering the fact that people would argue that this would be received as ‘spam’, a consideration should be made, whether communications is used to describe and stimulate current routines or whether it is related to new forms of initiatives defined in or to stimulate creativity and change. For instance, digital newsletters might have to be send by the alliance department to members which have voluntarily chosen (by filling in an online form on a website/digital platform) to be informed of the current initiatives. To enhance people to voluntarily chose to be informed, (alliance) managers should emphasize the additional differences (e.g. in prospective job opportunities or job guaranties) between those who are willing to be involved or not.

Re-considering the human interaction underlying the former recommendations given and the description stated in Chapter 5, a lot of concerns with regard to ‘social resistance’ could be identified apart from and inherently related to the fact whether knowledge, expertise or compatible tools and materials are already available and up to date, shared and adapted among the most effective organisational structures or underlying configurations. In line with these concerns, the following paragraphs describes several concrete recommendations and examples to understand how the underlying norms and values as embedded in the organisational culture might somehow be changed overtime, in a sense that process and product improvements will not stagnate or even be cancelled in the future.

7.4 Applying Cross Functional Utilization and Exchange among Different Departments and Institutes to Reduce ‘Social Resistance’ while measuring performance and enhancing Creativity or Knowledge sharing among Internal and External Key Persons

As already mentioned within the descriptions of the former recommendations ‘social resistance’ can be defined as a large overall problem, which means that this should not only be considered with respect to the former routine processes as stated in line with the hierarchical setting of a military organisation but also in relation to the process initiatives and partnerships stated to improve these routine processes and to create, develop and successfully integrate new alternatives as initiated within or outside the current organisational settings/boundaries. Subparagraph 5.3.4 showed that this is especially related to the attitudes towards performance metrics and feedback between individual persons. Instead of the fact that people show particular resistance towards process changes and cooperation, they also fear particular performance outcomes since this again affects their personal status in their daily activities. Therefore ‘social resistance’ against personal feedback and performance measuring of individuals and groups should be determined and eliminated through developing one overall metric which is visible and obviously clear and understandable for all participants within and even outside (in relation to the representatives of partner institutes) the own organisation. As mentioned in subparagraph 5.3.4, these performance metrics should be explicitly defined in relation to the overall objectives, true zero or reference points should be determined together with a particular ‘range’ (bandbreedte), key performance indicators should be determined and quantifiable according a process bottom line. Although this sounds opportunistic and quite simple, a certain qualification should also be determined according the social or psychological aspects as ‘trust’, ‘creativity’ and ‘satisfaction’. In line with social perspective this P&O officers should be(come) able to determine these personal aspects. As mentioned before, they should for instance measure absenteeism and labour turnover among the employees to determine how particular employees experience particular
transitions. If these personal officers are not capable enough to determine the underlying causes and potential solutions, specialist in human performance management should be hired to teach these officers how to overcome these problems. It is not an option to only ask external specialist (mediators) to do several consults within the organisation without the fact that the personal officers did not learn anything at all. Also these personal officers should be open minded and realize how they can learn from particular consults. This again reflects the overall need to introduce ‘open organisational learning’ in general and to appropriate particular knowledge and expertise and really store and (re) effectuate the data collected.

Performance metrics in general are not the only mechanisms which should be used to further stimulate the interaction and feedback between individuals or between the partner institutes. For instance, Cross functional utilization or exchange will be highly relevant to identify and support the considerations embedded within this feedback overtime. By doing this, people will get certain experiences which would otherwise hardly measurable or even hard to be explicit definable. Through a certain intuition or visibility, they might get different feelings how particular causes and initiatives introduced and applied by themselves result in certain performance outcomes elsewhere or while considering different moments in time. While considering these forms of enhancement by focusing on individuals, managers should realize how to select the right persons to be involved. This might somehow be different in comparison to the selection of general process leaders and their competences and capabilities as described above. For instance, process leaders should rather be able to make clear determinations and control well formalized routines, while participants required to be involved in the effectuation of a partnership and process improvement, should rather have competences and capabilities which stimulate creativity, criticism and external and internal vision towards new opportunities and innovation. So, this means that those persons who should be involved in these functional utilisations or exchanges are willing to change and capable (e.g. accept different cultures, speak different languages, understand the needs and differences between the own internal organisation/department and those related to other partners/representatives within a network / organisation) to voluntary participate in for example, informal interactions, meetings or platforms based on a broad diversity of functional or complementary inputs as gathered from different levels of (co) operation, in order to stimulate individuals to create and apply new initiatives by themselves. These complementary inputs should also be gathered through so called ‘gate keepers’, ‘key persons’, or ‘Glo-cals’. These persons should be selected through formal or informal interactions with regard to their competences to focus on two sides. First of all, they should be able to identify structural holes or components within an internal system. Secondly, they should be able to continuously scan external environments, search for, pull and estimate potential added value among cooperating entities in order to fill structural holes or components defined within the internal system (see also paragraph 7.2). The informal selection of ‘key figures’ might occur outside a former configuration, for example unknown competences of individuals might become visible through participation within the following forms of operation: Public, Private, Knowledge Institutes and Non governmental or Non profit organisations (NGO/NPO). Although the latter might sound quite simplistic, this might somehow be underestimated.

Considering these enhancements, differences might occur if participants are exchanged in small groups rather than individual exchanges. This might be relevant to overcome a certain ‘group conformity’, which means that the individual experiences a certain ‘pressure’ to take the former norms and values embedded in a group’s culture. It is relevant for the individual to learn from such a group, but on the other hand it can negatively affect the fact that the group itself will not be open minded, willing to change, learn and adapt the expertise and knowledge from the individual. This can somehow be reduced if several new individuals are placed in a former group. Considering this, key persons should not only be selected according their ability to understand both internal and external requirements. They should also be willing and not be afraid to take part in new experiments, dare to make certain mistakes and take the responsibility out of it, genuinely speak about new opportunities and visualize these, able to (informally) anticipate on different organisational levels to determine new alternatives, stimulate and ‘trigger’ others to take action and really effectuate new initiatives despite of a large amount of group pressure (conformity), bureaucratic procedures and an unobvious prospective for the long term.
Considering ‘social resistance’ and bottom up concerns in particular, a changing role should be considered with regard to the Employers’ Organisation (Medezeggenschapsraad). Considering the assumption that this department knows different opinions gathered among the entire organisation, particular knowledge and expertise might be used in-effectively with regard to the overall transition LCW is involved in. For instance, this department should be asked to think ahead as well, they should be really involved in particular strategic sessions and somehow give their vision before particular decisions are made and proposed to the Employers’ Organisation. This again might save time and even strengthen an overall perspective, since representatives will not have to re-act ad-hoc. In this way, representatives are enhanced to think off and focus on particular opportunities instead of risks related to the decisions made and proposed by a management team. Although this might sound opportunistic, the implementation really requires good leadership. This means that top-management should be open-minded for bottom-up concerns and initiatives among different ‘operational levels or workplaces’ within the internal organisation, but they should also be aware of the fact that this will not influence the strategic directions of the organisation to much. Note again that this is especially relevant regarding the overall transitions and less with regard to former routines and processes defined according the ‘out-of-era operations’.

In order to reduce the fear particular individuals might have with regard to certain performance outcomes, managers should be trained and/or teach their participants how they should review certain actions afterwards. If they really focus on the fact and attitude that particular mistakes or incompatible process outcomes can be defined as ‘specific learning points/moments’, participants might become less terrified and willing to share their experiences in the future, especially if they desire the fact that they and others will learn from the overall mistakes. E.g. a presentation or meeting might be recorded (by camera) to evaluate and show the participants certain personal pitfalls afterwards. Although there might be a lot of resistance and privacy matters it is really worth to take this into account.

After applying the former recommendations, managers should re-consider the fact whether the alternatives were effective enough in relation to the overall performance required in line with the transitions and partnerships defined, in order to increase process efficiency and to effectively guarantee the overall right to exist of LCW and the ambitions to develop a ‘Centre of excellence’ (see Chapter 2). How opportunistic and important the initiatives required will be, managers should be aware of the fact that certain risks might re-occur over and over again, that others will be ‘running behind the facts’ in the future, that compatible/capable employees start to look and apply for jobs elsewhere (take away a certain part of knowledge and expertise!) while incompatible/incapable employees stay or even get promoted by a lack in new recruits and mismanagement of personnel officers! Considering these examples the following paragraph is used to describe several concrete recommendations in order to stimulate a continuous process of change.
7.5 Re-considering Performance Outcomes, Equal Profit Sharing and Rejecting / Replacing new Incompatibles

The former recommendations should be (‘re’-) effectuated over time. Be aware that the influence or performance outcomes will not always be directly visible. In this circumstance, patience is strongly recommended, but will be enhanced through mutual understanding and openness as well. In this sense, implementers should (‘re’-) consider and (‘re’-) act towards new objectives and subjectivities over time as stated in line with an entire product life cycle or potential business opportunities or threats. Therefore the participants should reconsider performance outcomes according to the functional and complementary needs as defined among different structural ‘holes’/’gaps’ and levels of cooperation, within and outside a former organisational configuration, in order to be able to re-act on potential risks and business opportunities as embedded in potential added value of cooperation in a network. In line with this, functional punishment and reward systems should be developed and implemented with respect to performance measuring and to enhance individuals or groups to create, share and implement new initiatives which benefit the internal organisation in the right direction. In line with this, managers should offer equal bargains and share potential benefits in order to overcome internal rivalry between collaborating entities.

Although these ideas or directions sound quite simple and managers might argue that these did not work in the past, or do not even work in the current processes, they are still required. Therefore top-management should really commit, listen (again) and collect bottom up concerns to create new forms of reward and punishment systems/mechanism. They should really take action and not be terrified to apply the systems and mechanisms in a way they were originally developed for. For instance, current reward systems, based on the fact that particular persons are ‘in turn’ to be rewarded, should be replaced by reward mechanisms which ‘really’ corresponded with a certain performance outcome and functionality as defined in an overall performance metric. Reward systems in general do not always reflect the possibility to offer more salary. Also the possibility to be promoted and focus on the career perspectives a certain participant has and might obtain through active participation in (new) forms of cooperation should be emphasized. Other forms of creative reward mechanisms should be determined by making a selection of the desires and needs a particular individual, group or even a partner organisation has and motivates. In general terms this reflects the recognition to determine the intrinsic and extrinsic forms of motivation to co-operate.

Considering the determination of particular incentives on organisational level, managers at LCW should obtain the possibility to re-invest their own savings (or at least a particular percentage) within the own organisation. If particular savings will be appropriated by other departments within the overall Ministry of Defence (or even other ministries), or annual budgets will be reduced cause of former improvements, participants who made extra efforts to come up with creative ideas and process or product improvements/solutions might somehow be less motivated or even refuse to re-collaborate in the future. In order to implement this, a reference can again be made towards the need to apply ‘real’ profit and loss accounts. In line with this an (independent) board of commissioners (raad van toezicht) might have to be established for a longer period in time. Within this board of commissioners a mix of independent and depended (e.g. former commanders or representatives of private institutes) individuals should be created. This might especially be relevant to reward particular participants after a certain period in time instead of directly after a certain implementation took place. In this manner individual top managers might strategically act towards long term- instead of short term objectives which offer them particular rewards on the short term.

Furthermore general (e.g. KPI indicators only) performance outcomes should be visible (graphics, tables or drawings) and obviously published among different groups. As mentioned in relation to the former descriptions given in relation to communication, standard forms or communication and procedures might be applicable over and over again, but managers should really consider new forms of publishing in order to stimulate creativity and result driven process outcomes. They might have to consider competitive forms of action and publish the results related. These results should again
become visible for particular representatives of internal as well as external departments or institutes. Reconsider and ask rhetorical question over and over again. Keep asking why particular initiatives would and can easily be implemented. Ask whether and why particular initiatives are purposefully delayed. This might sound negative, but unfortunately true!

Celebrate kick offs, the achievement of particular milestones and successful overall performance outcomes in a broad content. Demonstrate and publish a summary of these celebrations in (in)formal manners, but take a small opportunity to quickly integrated several formal arguments why the initial successes has been reached and how this affected the overall ambition of the entire organisation on the long term. In this way, participants remember particular celebrations (which is also of form of reward) and might reconsider the question why these where organized in particular.

If really nothing will work, managers might have to consider artificial escalations on the short term, in order to show (visualize) certain risks, trigger people to really act. This should be taken into account in great trust, discretion and special desire to overcome further escalations. Note that this is not the same as a training program. During a training program, participants are informed (before or afterwards) about the fact that they are/were just tested. Apart from this or in convergence, managers might have to spread certain rumours, which are purposefully based on falsifications/ untruths. This might sound ridiculous, but by doing this managers enhance their employees to re-consider particular arguments overtime and test these employees whether they are able to reject particular decisions and dare to speak about alternatives, actual believes and facts to determine real opportunities. The question is whether these two examples are ethically right, since managers have to abuse particular individuals and their personal believes. So again! This really involves great trust, discretion and special desire to implement these forms of enhancement.

Focusing on the formal procedures and contracts stated according a mutual partnership/ alliance or routines in the internal organisation; an ‘exit clausal’ should be stipulated and integrated. Remember, the continuation of a partnership itself is not the overall objective! An actual or tailored fulfilling of the requirements and needs defined according the entire product/process life cycle of the lead/end-consumer(s) and their targets are higher/ the highest objectives. So this again reflects the need to have the nerve to determine and take leave those initiatives, tools, capabilities, incompatibles and even really fire or replace those persons who do not match with the changing requirements and needs.

**7.6 Overall reflection: Consider Mutual Ambidexterity: Orchestrate with a long term vision! But don’t forget to manage and (re-)act today!**

Considering all recommendations and directions given above, several process steps should be realized and implemented. Although particular recommendations sounded quite opportunistic, simple and recognizable (but still have not been applied correctly cause of ‘social resistance’) a certain twofold / mutuality should be re-emphasized in general. Managers should really understand the overall difference between the ‘fixed’ attitude required according former and current routines or processes within the internal organisation defined and integrated in the hierarchical (military) setting and the parallel attitude required in order to be(come) ‘open minded and creative’ to continuously be able to collaborate, change and adapt the external risks and opportunities (for further (dis)integration of current/potential: suppliers, organisational configurations, customers and (end) consumers demands) on Macro and Meso level based on market mechanisms. Considering the mutuality between both attitudes, managers at LCW should indeed pay attention to the fact how this further evolves over time, which again reflects the overall principles of a hybrid mechanism between market and organisational hierarchy as defined in alliance literature, Chapter 3 and further integrated in the overall descriptions and recommendations given within this report.
So, considering this mix or mutuality a ‘structural hole network’ based on the combination of fixed/closed configurations and open settings should be orchestrated by LCW rather than an external institute or broker who tries to do the same, in order to overcome external dependencies and to strengthen the strategic directions in the future. Therefore, the PPP Pilot between LCW and DAS should not be seen as a bilateral agreement, but as a network perspective which is carefully orchestrated by LCW itself. In line with this, the recommendations stated pursuant to an internal perspective should be extended with respect to the external network perspectives as well.

Considering the latter to a larger extent, participants should realize and consider the relevancy of particular improvements and innovative technologies/solutions for others within or outside a current industrial network. The potentials underlying the technical spin offs and spill overs which might occur, reflect again the reason why representatives of the Ministry of Economic Affairs (who have a relatively broader perspective since they are participating in different industrial market sectors among a wide diversity of geographical areas) should be strictly integrated within the overall transitions and process initiatives as described within this report. If another institute, even within another industrial market sector, really obtains unpredictable profits out of such a spin off or spill over, LCW or particular key-persons should be aspired to claim a sort of compensation/profit sharing or cost reduction on prospective co-operations from such an organisation. On the other hand, this also reflects the overall/(inter)national risks of particular delays, the lack of determination with regard to the national and internal political perspectives or visions and demolition of certain long term investments (e.g. JSF). For instance, mismanagement and a lack of vision according the acquisition of a replaceable ‘instrument’ for the F16 might not directly lead to visible losses of economical value and profit on the short term, but long term losses might occur due to the fact that the (Defence) related industry is not/or less allowed to be participating in compensation orders which are again required to be able to continue and make reinvestments in long term initiatives, Research and Developments projects. Managers at LCW should use this perspective to lobby (e.g. in relation to Political and OEM representatives, see paragraph 5.2) and to further develop a convergent perspective towards the future.

7.7 Restricting and Applying Further Research at LCW

Although the suggestions according further research stated in Chapter 6 might be relevant, especially from scientific point of view. Managers at LCW should consider the costs and time involved and should really be aware that people should not hide themselves behind the fact that following up research is still in process. They should re-act on real risks and business opportunities and implement these recommendations, before someone else disrupts their overall position in: an industrial market, network, and organisation or among particular departments. For example, as mentioned while giving an example towards the actions P&O officers should have to take, external research or knowledge and expertise might be relevant, internal employees at LCW should be able to and learn to act and make ‘real’ decisions by themselves rather than ‘only’ relying on external consultants. The need for further research and consultants might there for be reduced by making use of clearly organised data bases and periods of overlap between different representatives of a particular function in a workforce. For example, representatives of another PPP project (partly outside the core focus of this case study) argued during a symposium (PPP Kromhout Kazerne) that they were not able to repeat certain processes and might have to re-invest and increase the initial cost defined, since the data and expertise obtained through particular research, investigation and actions is still kept by a former consultant instead of the PPP project team itself. The same is countable for managers, a well organized manager should make him/herself superfluous at a former position while teaching his/her team to do the job by themselves and how they should continue their processes in the future without the need to hire new experts which unnecessarily increases the initial costs.
7.8 Closing Remark

Regarding the overall topics studied and described according this case study, the recommendations stated above were defined corresponding the question how potential added value of cooperation in a network can be effectuated to benefit the own internal organisation of LCW. This question was formulated corresponding the need to get new insights and perspectives on inter firm cooperation/initiatives between Public and/or Private Partners in an industrial network and how this affects the internal organisation of LCW. These insights and perspectives were required due to several major transitions and trends in the Dutch Military / European Defence Industry as caused by former decisions made on International/ governmental Level in a period defined after the ‘Cold War’.

Hopefully the descriptions and recommendations given within this report gave positive insights and perspectives to be successfully integrated and implemented within the entire organisation to strengthen the underlying and current transitions, the organisational structure, overall activities related to inter firm cooperation, social and cultural attitudes and off course the entire overall performance and ambition to develop a ‘Centre of Excellence’ for military & civil aircraft and helicopter engine maintenance in the Netherlands. Hopefully these insights also encourage participants to develop, share and implement a broader vision regarding potential technologies, product and process improvements/innovations related to the spin offs and spill over effects mentioned according the High Tech Technologies involved in the Dutch Defence and MRO Industry.
References


Hoofd planning and Control LCW Top Document LCW, Concept 2007) available on request.


# Acronyms and abbreviations

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
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<tr>
<td>AAR</td>
<td>After Action Review</td>
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<td>AFB</td>
<td>Air force Base</td>
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<td>BOM</td>
<td>Noord-Brabant Development Agency</td>
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<td>CTM</td>
<td>Centrum voor Technologie en Missieondersteuning / Centre Technology and Mission Support</td>
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<td>DAS</td>
<td>Dutch Aero Services</td>
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<td>DMO</td>
<td>Defence Materiel Organisation</td>
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<td>EDA</td>
<td>European Defence Agency</td>
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<td>EU</td>
<td>European Union</td>
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<td>EZ</td>
<td>Economische Zaken/Economic Affairs</td>
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<tr>
<td>F/A 18</td>
<td>Fighter attack jet</td>
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<td>F-100</td>
<td>F16- engine</td>
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<td>F-16</td>
<td>Fighter jet, military aircraft</td>
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<td>F-35</td>
<td>JSF</td>
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<tr>
<td>IDL</td>
<td>Institute Defensie Leergangen (symposium PPP Kromhout)</td>
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<td>ITEM</td>
<td>Innovation, Technology Entrepreneurship &amp; Marketing</td>
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<td>IO</td>
<td>Industrial Organisation</td>
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<td>JSF</td>
<td>Joint Strike Fighter, Fighter jet, military aircraft</td>
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<td>KMA</td>
<td>Koninklijke Militaire Academie</td>
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<td>KPI</td>
<td>Key Performance Indicators</td>
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<td>LC-Klu</td>
<td>Logistiek Centrum- Koninklijke Luchtmacht</td>
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<td>LCW</td>
<td>Logistiek Centrum Woensdrecht / Logistic Centre Woensdrecht</td>
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<td>LOI</td>
<td>Letter of Intent (Mutual agreement)</td>
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<td>MCC</td>
<td>Maintenance Competence Centre</td>
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<td>MEC</td>
<td>Maintenance Education Consortium</td>
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<td>MinDef</td>
<td>Ministerie van Defensie/ Ministry of Defence</td>
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<td>MinEZ</td>
<td>Ministerie van Economische Zaken/ Ministry of Economic Affairs</td>
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<tr>
<td>MKB</td>
<td>Midden en klein bedrijf(SME)</td>
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<td>MRO</td>
<td>Maintenance, repair and overhaul</td>
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<td>MV</td>
<td>Maintenance Valley</td>
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<td>NATO</td>
<td>North Atlantic Treaty Organisation</td>
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<td>OEM</td>
<td>Original equipment manufacturer</td>
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<td>OSM</td>
<td>Organisation Science and Marketing</td>
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<td>PFI</td>
<td>Profiting from Innovation - framework (Teece, 1986)</td>
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<td>PFI/PPP</td>
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<td>Publiek Private Samenwerking</td>
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<td>Rewin</td>
<td>Regional Development authority NV REWIN West-Brabant</td>
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<td>Research and Development</td>
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<td>RNLAF</td>
<td>Royal Netherlands Air Force</td>
</tr>
<tr>
<td>SME</td>
<td>Small and Medium Sized Enterprises (MKB)</td>
</tr>
<tr>
<td>USAF</td>
<td>United States Air Force</td>
</tr>
<tr>
<td>WCM</td>
<td>World Class Maintenance</td>
</tr>
<tr>
<td>WCMC</td>
<td>World Class Maintenance Consortium</td>
</tr>
</tbody>
</table>
37 Joint Strike Fighter (JSF)

**JSF**

In 2007 wordt het MoU ten aanzien van JSF-testtoestellen ondertekend. In 2008 wordt de busines case herijkt voordat in 2009 besluitvorming plaatsvindt over de contractondertekening voor de definitieve aanschaf van testtoestellen. Op basis van de herijking en van een vergelijking voor wat betreft prijs, kwaliteit en levertijd met mogelijke andere toestellen zal het kabinet in 2010 besluiten aan de Tweede Kamer voorleggen over vervanging van de F16 toestellen. (pijler 1)

1. Inhoud

Nederland neemt met acht andere landen deel aan de ontwikkeling van een nieuw gevechtsvliegtuig, de Joint Strike Fighter (JSF). In ruil voor een bijdrage van de Nederlandse Staat aan de ontwikkeling van de JSF, kan de Nederlandse Luchtvaartindustrie opdrachten verwerven bij de hoofdaannemers (VS) in ontwikkeling, productie en instandhouding van de JSF (industriële participatie). Het JSF-programma is gestart met de ontwikkelingsfase (SDD fase) in 2002. In november 2006 is het multilaterale MoU voor de volgende fase ondertekend (nl. voor productie en instandhouding).

Partnerlanden: Verenigde Staten, Verenigd Koninkrijk, Australië, Canada, Noorwegen, Denemarken, Italië en Turkije. US Hoofdaannemers: Lockheed Martin, Pratt & Whitney (motoren) en Fighter Engine Team (General Electric & Roll’s Royce, motoren)

**2002: Uitgangspunten**


- Deelname aan ontwikkeling van de JSF kost meer dan achteraf kopen van de plank (dit verschil in kosten is berekend in een ‘Business Case’). De Staat sluit een overeenkomst met de Nederlandse Luchtvaartindustrie om dit ‘gat in de Business Case’ – dan wel ‘het verschil’ – te dichten: de Medefinancieringsovereenkomst (MFO). De industrie verplicht zich in deze MFO 3,5% van haar omzet -behaald uit deelname aan de productiefase van het JSF programma- aan de Staat af te dragen. De hoogte van dit percentage wordt in 2008 opnieuw vastgesteld (na herberekening van de Business Case). Gedachte hierachter is dat industriële voordelen dermate hoog zijn, dat het verschil niet voor rekening van de Staat dient te komen.

- De omzetverwachtingen voor de NL Luchtvaartindustrie worden geschat op:
  - Bij Lockheed Martin: $ 800 mln. in de ontwikkelingsfase (SDD) en $ 8 mld. in de productiefase (op basis van een productie van 6000 vliegtuigen).
  - Bij Pratt & Whitney (P&W, motorenleverancier): $ 1 mld. in de productiefase
  - Bij het Fighter Engine Team (FET, motorenleverancier), ca. $ 1 mld. in ontwikkeling- en productIEWERK. NB: dit is niet aan de Nederlandse Staat, maar direct aan Philips gemeld.
2. Stand van zaken

2006: Stand van zaken

- Het PSFD MoU (voor de productie, doorontwikkelings- en onderhoudsfase) is gereed na vele (multilaterale) onderhandelingsronden. Hierin is ook paragraaf industriële deelname opgenomen, waarin spelregels zijn vastgelegd m.b.t. gelijk speelveld.


- De industriële teller staat op ruim $720 mln. in SDD-fase. Dit betreft $346 mln. SDD-opdrachten en $375 mln. LRIP-opdrachten (eerste kleinschalige productiefase). De SDD fase loopt tot 2012.

- Inmiddels hebben bijna 70 MKB-bedrijven werk aan de JSF.

- JSF programma zorgt niet alleen voor omzet, maar voor ook kennis (innovatie) zoals blijkt uit recent verschenen studies van NIVR en de Universiteit van Tilburg; deelname aan het JSF programma blijkt gunstig voor de ontwikkeling van de NL kenniseconomie.

- Onderhandelingen over industriële participatie met de Amerikaanse hoofdaannemers Lockheed Martin (LM), Pratt & Whitney (P&W) en het Fighter Engine Team (FET) zijn -voor iedere hoofdaannemer apart- vastgelegd in een Letter of Intent (LoI).

- Ondertekening van LoI’s op 9 november 2006 door StasEZ (m.b.t. productie en doorontwikkeling) en door StasDEF (m.b.t. instandhouding). In aanwezigheid van Nederlandse luchtvaartindustrie. LOI LM is vóór de besluitvorming over voortzetting van het JSF programma, vertrouwelijk aan de Tweede Kamer gestuurd.

3. Toekomst

- In 2006 zijn door de US overheid de eerste fondsen voor productie vrijgegeven. In 2007 worden de eerste afdrachten van de Nederlandse industrie uit productieomzet verwacht.

- In juni 2008 zal de businesscase opnieuw worden berekend. Verschillende variabele parameters uit de businesscase kunnen dan anders zijn dan in 2002 (bijvoorbeeld dollarkoers, verwachte aantallen te produceren toestellen, etc). Op basis van deze herberekening zal het door de industrie af te dragen percentage over de Productieomzet opnieuw worden vastgesteld, en gelden ‘for better and for worse’ tot het einde van het JSF programma.

Source: Ministerie van Economische Zaken, Introductiedossier bewindslieden EZ 2007. Note; other relevant information according to the source of this document has not been provided in the document.