NUAC Programme

Definition Phase Supplementary Report

Appendix 17

Integration Strategy

August 2007

NUAC Programme

Supplementary Report Appendix 17: Integration Strategy

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- Design of initiative-based integration scheme
- Design of integration principles

Introduction

Introduction

This document contains additional analyses to the findings conducted during the NUAC Definition Phase – presented in the Final Report (Final Report, Chapter 5 and Appendix 5). More specifically, the document contains following additional analyses:

- **Integration principles –** the integration principles presented in Final Report are developed further through using the experiences from the latest implementation projects in LFV/ANS and Naviair, e.g. EPN, COOPANS
- **Initiative-based Integration Scheme** which assures the ability to realise the NUAC vision:
  - The initiative-based Integration Scheme does not focus on a specific scenario since it can be applied in all scenarios
  - The rationale is to develop a more coherent and flexible approach compared to the somewhat high-level Integration Scheme in the NUAC Definition Phase Final Report, which presents a scenario-based integration approach. This implies a choice between one of the alternatives, but does not take into account that elements from more than one scenario can be combined
  - It should be stressed that the four drivers/perspectives and integration schemes are illustrative models and can help guide the detailed implementation planning
  - It should also be stressed that the integration schemes only address the initiatives. Activities required to complete the implementation are not included, e.g. technical integration of ATM and CNS systems, training, cultural integration, HR transition and retention

Reader's guidelines

This document contains four different chapters:

- **Background and scope**
- **Conclusion –** the high-level findings from both analyses
- **Initiative-based integration scheme** – description of the framework, method, and sub-results
- **Integration principles –** description of the integration principles developed by analysis of relevant integrations projects

To get a complete overview of the Integration Strategy for the NUAC Programme, the reader must also see Final Report and Appendix 5

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Background and scope

Purpose and scope

Purpose

- To develop a new scheme for the integration of NUAC by rethinking the existing scenario-based approach combined with supplementary coherent initiative-based perspectives. This also includes:
  - analysis of dependencies between initiatives
  - analysis of each initiative in terms of risk/complexity, benefit, sustainability, and speed
  - analysis of sequence and timing of the initiatives in order to maximise benefits and minimise risks
  - design of integration plan for the initiatives
- To further develop the integration principles presented in NUAC Definition Phase Final Report by using the experiences from the latest implementation projects in LFV/ANS and Naviair, e.g. EPN, COOPANS

Scope and approach

- Validation of the 17 already identified benefit realisation areas – the initiatives
- Better use of experiences from latest implementation projects
- Focus on the establishment of NUAC Company

Outcome

- Robust and realistic initiative-based integration scheme
- An overall analysis of each initiative based on the different analytical perspectives
- Description of high-level Integration Scheme from new perspectives

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Conclusion

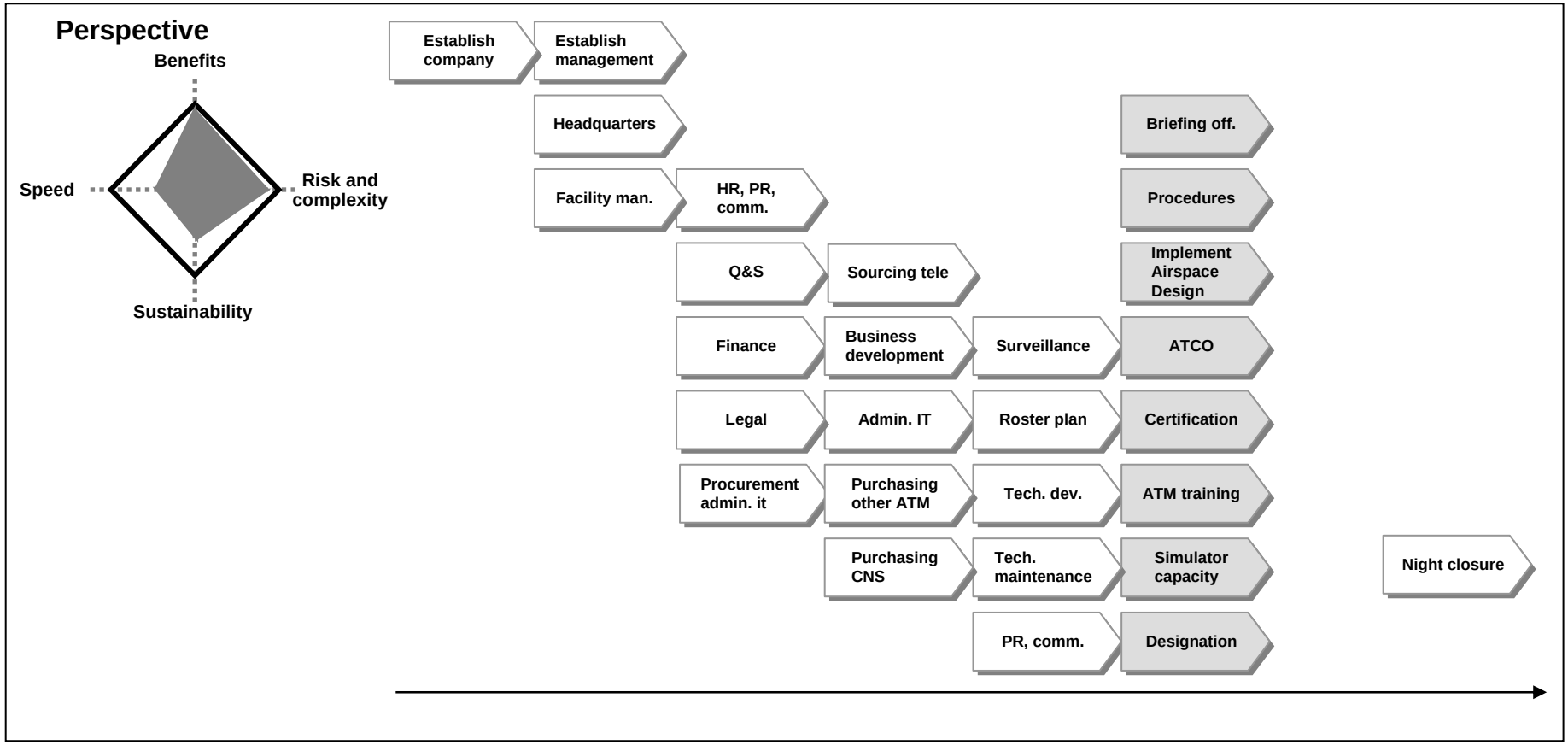
Design of initiative-based integration scheme (1/3)

- The **purpose** of the initiative-based integration approach is to develop a new scheme for the integration of NUAC by rethinking the existing scenario-based approach and create a more flexible initiative-based integration scheme
- The overall conclusion is that an initiative-based integration scheme is **both possible and a desirable alternative** to the scenario-based perspective
- The integration scheme is formed on the basis of an evaluation of each initiative. The evaluation of the initiatives is done according to four drivers: **benefits, Risk/Complexity, sustainability, and speed.** The initiative-based integration should create a base for a stepwise integration of NUAC.
- From the current perspective of NUAC, it is recommended to focus on investigating the two main drivers for this project: **benefits and risk/complexity,** to give an overall integration scheme (shown on the next pages):
  - **Benefit perspective** - the primary strategic rationale for NUAC is focus on cost-effectiveness and socio-economic benefits (political and socio-effects, and environment); hence this is an important imperative for the integration. The overall rationale for Single European Sky is to improve efficiency
  - **Risk/Complexity** - Air Traffic Management is complex (especially technologically and safety-wise); it is extremely important to choose risk assessment and mitigation over speed to ensure that safety and legislation issues are handled correctly. The set-up for the implementation of NUAC holds also a natural complexity due to cross-border perspective.
  - **Risk/Complexity** is also an important driver when dealing with HR issues, so in order to create a successful change, HR aspects should be thought into every aspect of the integration
  - **Sustainability** is an important factor, but seen from an overall point of view, sustainability should be assured when taking all Risk/Complexity issues into consideration by choosing a less radical change strategy

Conclusion

Design of initiative-based integration scheme (2/3)

- The sequence displays the logical order of integration based on the initiative evaluation and provides a flexible integration approach for NUAC Programme. However, it should be noted that a significant task lies ahead of the integration of preparing the implementation of the initiatives, e.g. alignment of IT platform and processes. Interdependencies should be further analysed in the next phase
- The main drivers behind the sequence are benefit and risk/complexity
- During the evaluation, other sequences based on other perspectives have been developed, i.e. speed and sustainability perspective
- The initiatives are colour-coded to illustrate groups that naturally belong together and/or depend on each other



Conclusion

Design of initiative-based integration scheme (3/3)

- A number of more specific findings related to each initiative can be derived from the analysis based on two main drivers benefit and risk/complexity
- Some initiatives are analysed to have **high benefits**, but also **high risk/complexity,** and it should therefore be considered carefully when these are implemented:
  - *Certification, Designation, Procedures, ATCO functions, Briefing officer functions, ATM training, Training Simulators,* and *implementation of New Airspace Design* need to be implemented simultaneously due to interdependencies
  - *Technical development* – entails large financial benefit but also complexity with regards to technology
  - *Technical maintenance*
  - *Business development*
- Initiatives with relative **low/medium benefits** and **high risk/complexity** should be implemented later rather than sooner:
  - *Night Closure of control centre*
  - *Sourcing of admin IT services*
- Initiatives with **high benefits** and **low/medium risk/complexity** should be implemented as early as possible:
  - *Establishing company*, *management*, *certification, and Airspace Development* are all in need of early implementation due to interdependencies to other initiatives and benefits regarding NUAC vision and socio-economics
  - *Roster planning*
- Initiatives with **low/medium risk/complexity** and **low/medium benefits** are not as important with regards to timing:
  - *Common purchasing, procurement and operation of admin IT, CNS, and 'other ATM'*
  - *HR, Finance*
  - *Surveillance*
  - *Sourcing of tele/data*
  - *Establish headquarter, facility management*
  - *Legal*

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The Method

Definition of the four integration perspectives

Approach

This report will develop a new integration scheme for the implementation of NUAC reflecting different integration perspectives*. A perspective is defined as an integration process which has a specific underlying rationale. This rationale is reflected in all aspects and decision of the integration process.

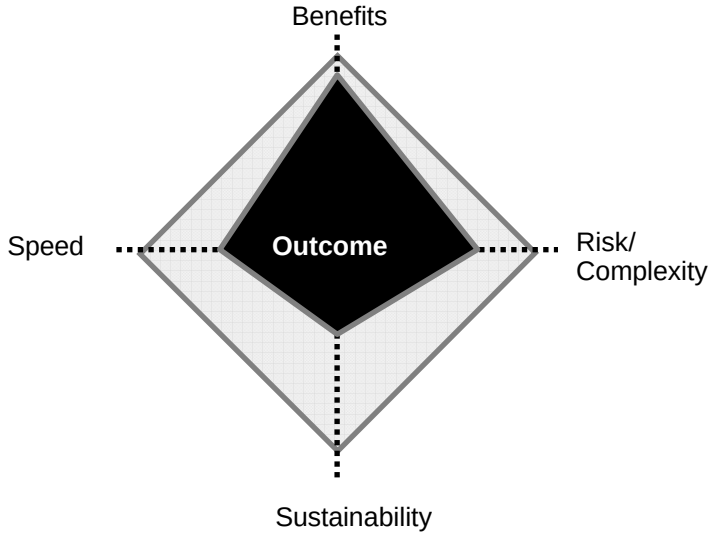
The report has analysed four different integration perspectives:

- **Benefit-driven integration perspective**. The integration phase will have strong focus on the realisation of the benefits. Initiatives with the highest benefit potential are considered as the most important and will have the highest focus
- **Speed-driven perspective**. The integration process will have focus on delivering the changes as quickly as possible; initiatives with potential showstoppers or with integration horizon will not be implemented
- **Risk/Complexity driven perspective**. The integration will focus strongly on minimising the risks; initiatives which are complex (defined as lack of experiences with the initiative) and contain high risk will be implemented late
- **Sustainability-driven perspective**. The integration will focus on delivering robust embedded solutions; Initiatives with critical stakeholders will be implemented late

It should be stressed that an integration project will always be based on a combination of the four elements, but the change programme needs to be focused towards the dominant change imperative, since the best outcomes are achieved when one or two factors dominate the change imperative.

The specific analytical operationalisation of each perspective is presented in the next chapter.

The four change perspectives



* The Final Report presents a scenario-based integration approach which must be considered as a somewhat simplified and inflexible approach since it implies a choice between one of the alternatives. Neither does it take into account that elements from more than one scenario can be combined.

The Method

The analytical framework consists of five different steps

The analysis for the Integration Strategy integration scheme is divided into five stages:

1. **Defining the integration initiatives.** Defining the relevant integration initiatives which will be analysed for the initiative-based integration scheme. This is done to ensure that all relevant integration projects are included. The basis is the 17 original initiatives – of which some are divided into several initiatives in order to investigate the different areas independently.
2. **Defining the interdependencies.** Defining the possible solution space and timeframe by analysing the interdependencies between the initiatives. This is done to clearly show that some initiatives are related to others; hence it is not necessarily possible to create the scheme entirely on the basis of e.g. the size of the benefit potential.
3. **Defining the evaluation criteria.** Best practice change programmes define four imperative drivers for change and conclude that the best outcomes are achieved when one or two factors dominate the change imperative.
4. **Conducting the analysis.** Analysing the initiatives according to the four dimensions described in the previous section: benefits, speed, risk/complexity, and sustainability, and determining the relative scores for the initiatives for each of these dimensions (for this purpose, Risk/Complexity are analysed independently). An additional two dimensions are added to the analysis implicitly: importance in order to fulfil NUAC vision and positive stakeholder opinion.
5. **Developing the integration scheme.** Developing integration scheme that focuses on each of the four dimensions emphasising early integration of the initiatives with the highest scores, but still taking into account the interdependencies between the initiatives. Each initiative is placed in the scheme according to the primary score from the analysis, i.e. all initiatives with the highest scores are placed as early as possible, still following the predecessor rules from the analysis of interdependencies.

Each stage is described in details in the next section.

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    2. Defining the interdependencies
    3. Defining the evaluation criteria
    4. Conducting the analysis
    5. Developing integration scheme
- Design of integration principles

Completion of the analysis

1) Defining the relevant integration initiatives

Integration initiative	Business area for NUAC Company	The analytical background and sources for the initiative
Establish company (legal entity) (Initiative 17 & Business Model) **Establish headquarter** (Initiative 17 & Business Model)	Business Model	*Business Case & Business Model*
Establish Airspace (Initiative 7 and 9) **Establish certification, designation** (Initiative 17)	Airspace design	*Business Case & Airspace design*
Establish management (Initiative 1)	Management	*Business Case*
Establish HR, PR, communication functions (Initiative 2a) including transferral of resources and alignment/establishment of processes **Establish finance function** (Initiative 2b) including transferral of resources and alignment/establishment of processes **Sourcing of facility management** (Initiative 2c) **Establish Q&S function** (Initiative 2d) including transferral of resources and alignment/establishment of processes **Establish legal services function** (Initiative 2e) including transferral of resources and alignment/establishment of processes **Establish ATM training function** (Initiative 2f and initiative 15) **Sourcing of admin IT services** (Initiative 2g) **Establish business development function** (Initiative 2h) including transferral of resources and alignment/establishment of processes	Administration	*Business Case & Business Model*
Establish procedures function (Initiative 5) including transferral of resources and alignment/establishment of operating procedures **Establish roster planning function** (Initiative 6) **Common briefing officer resource pool** (Initiative 7) including transferral of resources alignment/establishment of operating procedures **Common ATCO resource pool** (Initiative 9) including transferral of resources alignment/establishment of operating procedures **Night closure of control centres** (Initiative 8) including establishment of new operating procedures	Operational and operational support	*Business Case & Business Model*
Establish tech. development function (Initiative 3) including transferral of resources **Establish tech. maintenance function** (Initiative 4) including transferral of resources **Alignment of procurement and maintenance of administrative IT and additional applications** (Initiative 10) **Alignment of sourcing of tele/data communication services** (Initiative 11) **Alignment of purchasing and operation of standard 'other ATM systems'** (Initiative 12) **Alignment of use of existing surveillance infrastructure** (Initiative 13) **Alignment of purchasing and operation of standard CNS systems and infrastructure** (Initiative 14) **Alignment of use of existing basic and unit training simulators** (Initiative 15)	Technology (system)	*Business Case & Business Model*

Completion of the analysis

2) Rationales for interdependencies between initiatives (1/2)

- The rationales for the interdependencies between the initiatives are included to show that some initiatives are related to others; hence it is not necessarily possible to create the scheme entirely on the basis of e.g. the size of the benefit potential:
  - It is assumed that *establishing the company (legal entity)* is the first initiative; all other integration initiatives depend on this
  - Establishing a common NUAC *Headquarters* only depends on having established the company
  - Establishment of all business areas in NUAC (*HR, finance, business development* etc.) depends on the establishment of the NUAC *management* team
  - *Certification* depends on fulfilling EC Common Requirements and national legislation, i.e. having *established a company* with *Management, HR, Finance, Q&S, ATM training,* and *Procedures functions* in place, and also *ATCO functions* established
  - *Designation* depends on *Certification*
  - In order to implement a *new airspace design***,** it is necessary to have a common set of *procedures*, or alignment of procedures, and also to have a formal *quality and safety* policy. It also depends on *Certification, Designation, Management, HR, Finance, Q&S, ATM training, Procedures functions,* and *ATCO functions* being established prior to the implementation. Some alignment of ATM and CNS systems is also necessary in order to implement new airspace design (but does not directly depend on the common procurement and operation of CNS and 'other ATM systems' integration initiatives)
  - It might be possible to implement *ATM training* and common use of *Training simulators* independently, but in this context the integration initiatives are defined so that they depend on each other. *ATM Training* also depends on having *Certification, Q&S,* and common *ATCO function* established
  - *Technical Development* depends on *Certification* and *Q&S* in the Merger Scenario where NUAC is responsible for the technical development
  - Operational initiatives (common *ATCO function, briefing officers,* and *Night Closure*) depend on common *procedures* and *quality and safety* policies and also depend on *Certification, Designation, Implementation of new airspace design* (sectors and positions), *Management, HR, Roster Planning,* and *ATM Training*
  - Common *IT procurement, sourcing, operation,* and *maintenance* might be possible to establish without having a *NUAC management* team in place – but monitoring the processes will be easier if management is established first
  - Use of *Training simulators* depends on *Certification* and *Q&S* since these are the units which control the equipment
  - *Night closure* is deemed for late integration due to the high complexity and dependency on all other operational areas to be fully aligned and functional.
- It should be noted that interdependencies will be analysed further in the next phase in order to assure compliance with EC Common Requirements, certification, designation, legislation etc.

Completion of the analysis

2) Interdependencies between initiatives (2/2)

In the table below it is shown which initiatives depend on other initiatives, e.g. a predecessor for establishing Certification (third row) is the establishment of NUAC Company (first row), meaning that the company will have to be established before it can apply for certification. The dependencies are high level and will be further elaborated in the integration planning.

Integration Initiative / **Depend on implementation of**	Company (legal entity)	Headquarter	Certification	Designation	Impl. of New Airspace Design	Management	HR function	PR, Communication	Finance function	Facility Management	Q&S function	Legal Services	ATM Training function	Admin IT Services	Business Development	Tech. Development	Tech. Maintenance	Procedures function	Roster Planning function	Briefing Officers function	ATCO function	Training simulators
Company (legal entity)																						
Headquarter	x																					
Certification	x					x	x		x		x		x				x				x	
Designation	x		x																			
Implementation of New Airspace Design	x		x	x		x	x		x		x		x				x		x	x	x	
Management	x																					
HR function	x					x																
PR, Communication functions	x					x																
Finance function	x					x																
Sourcing of Facility Management	x					x																
Q&S function	x					x																
Legal Services function	x																					
ATM Training function	x		x			x					x						x			x	x	
Admin IT Services	x					x																
Business Development function	x					x																
Tech. Development function (1)	x		(x)			x					(x)											
Tech. Maintenance function	x					x																
Procedures function	x		x		x	x					x											
Roster Planning function	x					x																
Common Briefing Officer function	x		x		x	x					x						x					
Common ATCO function	x		x	x	x	x	x				x		x				x	x				
Night Closure of control centres	x		x	x	x	x	x				x		x				x	x		x		
Administrative IT systems	x					x																
Sourcing of tele/data comm.	x					x																
Standard 'other ATM systems'	x					x																
Surveillance infrastructure	x					x																
CNS systems and infrastructure	x					x																
Training simulators	x		x			x					x		x									

(1) Note: Implementation of *Tech. Development function* only depend on *Certification* and *Q&S* in Merger scenario, where NUAC is responsible for Tech. Development

Completion of the analysis

3) Overall rationales for evaluation criteria (1/2)

- Analysing the initiatives according to the four dimensions described in the previous section: Benefits, Risk/complexity, Sustainability, and Speed, and determining the relative scores for the initiatives for each of these dimensions

– **Benefit potentials** are evaluated according to
  – Financial benefits from the Business Case (annual savings and NPV for the initiatives)
  – Qualitative benefits and indications from the socio-economic analysis, i.e. initiatives related to airspace are important in relation to socio-economic benefits
  – Business benefits, i.e. how the initiative contributes to form a more formalised cooperation
  – The initiatives' importance in order to fulfil NUAC vision thus fulfilling SES vision and national strategies
– **Risk/Complexity** is evaluated from a perspective of
  – Flight Safety
  – Influence on retained organisations
  – Implementation and integration complexity
  – Technology and systems integration complexity
  – Stakeholder opinions
  – Ability to actually realise the benefits
  – HR aspects
– **Speed**, initiatives which are necessary to implement before others can be initiated are seen as especially important in relation to a rapid integration to drive the programme and change
– **Sustainability**, initiatives which are core for the business are important in relation to ensuring sustainability and creation of a robust solution, and it is necessary to focus on initiatives which instigate a more formal cooperation in order to create a sustainable solution

Completion of the analysis

3) Defining the relevant evaluation criteria (2/2)

Perspective	Analytical content	Implication
Benefit potential	▪ Internal benefit (financial benefit based on the BC including integration costs and non-financial benefit based on the BC) ▪ External benefit (financial benefit based on the socio-economical analysis and non-financial benefit based on the analysis in the BC) ▪ Analysis of the external stakeholder opinion regarding the initiative ▪ Analysis of the initiatives importance in order to realize NUAC vision including strategic rationale	▪ If initiative radically improves internal drivers – working environment, operational flexibility etc. ▪ Support all drivers regarding regional development, environmental improvements, national strategies, political and social effects etc. ▪ External stakeholders see this as a core part of NUAC in order to receive benefits
Integration risk/ complexity	▪ Analysis of the risks related to the initiatives (stakeholder resistance, productivity, benefit realisation etc). ▪ The analysis will be based on the risks assessment in Appendix 2 and additional analysis ▪ Analysis of the initiatives complexity regarding design of solution and integration ▪ Integration resource demand ▪ Factors for determining the level complexity: own experiences with the area, existing experiences from comparable industries, the initiatives' relations to other change initiatives, the technical complexity of the initiative, the legal complexity of the initiative	▪ Risks are high concerning realisation of benefits, reduced productivity etc. ▪ Might not comply with current development initiatives in LFV/ANS and Naviair, many relations to other initiatives, technical difficulties etc. ▪ Will affect position of retained organisations (Naviair and LFV/ANS) ▪ Will disturb daily operations ▪ Might come upon technical difficulties etc.
Ensuring sustainability	▪ Analysis of which initiatives contribute to creating a sustainable solution	▪ Is importance in order for NUAC to be a robust solution ▪ If initiative is crucial in order to comply with strategic rationales
Speed importance	▪ Analysis of which initiatives need to be implemented quickly in order to achieve a robust solution	▪ If speed is crucial in order to deliver a good solution

Completion of the analysis

4) Conducting the analysis – Summary of initiative scores (1/5)

Initiative	Benefit potential	Risk/Complexity	Sustainability	Speed
Establish company (legal entity)	Low	Low	High	High
Establish headquarters	Low	Low	Medium	High
Implementation of New Airspace Design	High	High	High	High
Establish Certification	High	Medium	Medium	Medium
Establish Designation	High	Medium	Medium	Medium
Establish Management	Low	Low	High	High
Establish HR function	Medium	Low	Medium	Medium
Establish PR, Communication functions	Low	Low	Medium	Medium
Establish Finance function	Medium	Low	Medium	Medium
Sourcing of Facility management	Low	Low	Low	Low
Establish Q&S function	Medium	Medium	Medium	Medium
Establish Legal services function	Medium	Low	Medium	Medium
Establish ATM training function	Medium	Medium	Medium	Medium
Sourcing of Admin IT services	Low	Medium	Low	Low
Establish Business development function	Medium	Medium	High	Medium
Establish Tech. development function	High	High	Medium	Medium
Establish Tech. maintenance function	Medium	Low	Medium	Medium
Establish Procedures function	High	High	High	High
Establish Roster planning function	Medium	Medium	Medium	Medium
Common Briefing officer resource pool	Medium	Low	High	High
Common ATCO resource pool	High	Medium	High	High
Night closure of control centres	Low	High	Low	Low
Purchasing and maintenance of administrative IT	Medium	Medium	Low	Low
Alignment of sourcing of tele/data communication services	Low	Low	Medium	Low
Purchasing and operation of standard ‘other ATM systems’	Medium	Medium	Medium	Medium
Alignment of use of existing surveillance infrastructure	Medium	Low	Medium	Medium
Purchasing and operation of standard CNS systems	High	Medium	Medium	Medium
Alignment of use of existing basic and unit training simulators	Low	Medium	Medium	Medium

Completion of the analysis

4) Conducting the analysis – Benefit imperative score (2/5)

Initiative	Benefit potential	Overall rationale
Establish company (legal entity)	Low	No specific financial benefits (but some costs), but a precondition for establishing NUAC
Establish headquarters	Low	Possibility of financial benefits, but this depends on the decision on location of NUAC
Implementation of New Airspace Design	High	High potential socio-economic benefits, environment, very beneficial for stakeholders (airlines)
Establish Certification	High	No specific financial benefits, but important in order to realise NUAC
Establish Designation	High	No specific financial benefits, but important in order to realise NUAC
Establish Management	Low	Initiative is approx. cost neutral due to management re-staffing from retained organisations
Establish HR function	Medium	Some reductions in need for resources and therefore small financial benefits, but important in order to realise NUAC
Establish PR, Communication functions	Low	Few reductions in need for resources and therefore small financial benefits, but important in order to realise NUAC
Establish Finance function	Medium	Reduced need for resources results in some financial benefits, important in order to establishing NUAC Business support
Sourcing of Facility management	Low	Few reductions in need for resources and therefore small financial benefits
Establish Q&S function	Medium	Some financial benefits, some importance with regards to NUAC core business
Establish Legal services function	Medium	Some reductions in need for resources and therefore small financial benefits, important for NUAC core business
Establish ATM training function	Medium	Some reductions in need for resources and some financial savings potential
Sourcing of Admin IT services	Low	Few reductions in need for resources and therefore small financial benefits
Establish Business development function	Medium	Few reductions in need for resources and therefore small financial benefits, some importance for NUAC vision
Establish Tech. development function	High	Reductions in need for resources leads to a significant annual savings potential
Establish Tech. maintenance function	Medium	Sourcing solution results in financial savings potential
Establish Procedures function	High	Large annual savings potential, important for NUAC vision and establishment of core business
Establish Roster planning function	Medium	Some reductions in need for resources and some financial savings potential
Common Briefing officer resource pool	Medium	Some reductions in need for resources and some financial savings potential, important for core business
Common ATCO resource pool	High	Reductions in need for resources lead to a significant annual savings potential, important to fulfil NUAC vision
Night closure of control centres	Low	Some reductions in need for resources and some financial savings potential
Purchasing and maintenance of administrative IT	Medium	Some savings potential due to economics of scale, no significant fulfilment of strategic rationales
Alignment of sourcing of tele/data communication services	Low	Some savings potential due to economics of scale, no significant fulfilment of strategic rationales
Purchasing and operation of standard ‘other ATM systems’	Medium	Some savings potential due to economics of scale, investment savings
Alignment of use of existing surveillance infrastructure	Medium	Savings related to closure of duplicate radars, investment savings
Purchasing and operation of standard CNS systems	High	Some savings potential due to economics of scale, large investment savings
Alignment of use of existing basic and unit training simulators	Low	Few savings related to closure of duplicate simulators

Completion of the analysis

4) Conducting the analysis – Risk/Complexity score (3/5)

Initiative	Risk/Complexity	Overall rationale
Establish company (legal entity)	Low	Little complexity in establishing the company once terms have been agreed
Establish headquarters	Low	Little complexity in establishing once the decision on location has been taken
Implementation of New Airspace Design	High	Complex to establish, demands and common requirements, no current successful European experiences
Establish Certification	Medium	Some complexity due to common requirements, legal demands etc.
Establish Designation	Medium	Some complexity due to common requirements, legal demands etc.
Establish Management	Low	No specific complexity in establishing management
Establish HR function	Low	No specific complexity in establishing general business division areas
Establish PR, Communication functions	Low	No specific complexity in establishing general business division areas
Establish Finance function	Low	No specific complexity in establishing general business division areas
Sourcing of Facility management	Low	No specific complexity in sourcing of facility management services
Establish Q&S function	Medium	Some complexity due to different requirements in Sweden and Denmark
Establish Legal services function	Low	Some complexity due to different requirements and legislations in Sweden and Denmark
Establish ATM training function	Medium	Some complexity due to different coordination and administration in DK and SE
Sourcing of Admin IT services	Medium	Different administrative IT systems and infrastructure in the two organisations
Establish Business development function	Medium	Some complexity in alignment of business development and strategies
Establish Tech. development function	High	Some complexity in common tech. development due to interdependencies
Establish Tech. maintenance function	Low	Little complexity in common sourcing of technical maintenance
Establish Procedures function	High	Some complexity in establishing common procedures, fulfilling national legislation etc.
Establish Roster planning function	Medium	Some difficulty in establishing ATM roster planning due to business complexity
Common Briefing officer resource pool	Low	Little complexity in common briefing officer function
Common ATCO resource pool	Medium	Some difficulty in establishing common ATM core business area
Night closure of control centres	High	High complexity in development of solution regarding legislation etc.
Purchasing and maintenance of administrative IT	Medium	Some complexity in common tech. areas due to differences in standards
Alignment of sourcing of tele/data communication services	Low	Little complexity in alignment of sourcing telecommunication.
Purchasing and operation of standard ‘other ATM systems’	Medium	Some complexity in common tech. areas due to differences in standards
Alignment of use of existing surveillance infrastructure	Low	Little complexity in cooperation regarding radar coverage due to current experiences between Denmark and Norway
Purchasing and operation of standard CNS systems	Medium	Some complexity in common operation due to differences in standards, systems etc.
Alignment of use of existing basic and unit training simulators	Medium	Some complexity in closing simulators

Completion of the analysis

4) Conducting the analysis – Sustainability imperative score (4/5)

Initiative	Sustainability	Overall rationale
Establish company (legal entity)	High	Very important in order for NUAC to sustain
Establish headquarters	Medium	Important to create a common base and framework for NUAC to evolve
Implementation of New Airspace Design	High	Very important for NUAC in relation to entry of new partners in the cooperation
Establish Certification	Medium	Important in order for NUAC to perform core business
Establish Designation	Medium	Important in order for NUAC to perform core business
Establish Management	High	Very important for NUAC to be established and get a good start
Establish HR function	Medium	Some importance in order to get a common business establishment
Establish PR, Communication functions	Medium	Some importance in order to get a common business establishment
Establish Finance function	Medium	Some importance in order to get a common business establishment
Sourcing of Facility management	Low	Not especially important with regards to NUAC core business or for the company to sustain
Establish Q&S function	Medium	Importance in relation to performance of core business
Establish Legal services function	Medium	Some importance in order to get a common business establishment
Establish ATM training function	Medium	Common training is important for common business culture and foundation
Sourcing of Admin IT services	Low	Not especially important with regards to NUAC core business or for the company to sustain
Establish Business development function	High	Common future strategy and business development is important for NUAC
Establish Tech. development function	Medium	Common tech. development is an important business area, but not vital for NUAC vision
Establish Tech. maintenance function	Medium	Common maintenance is an important business area, but not vital for NUAC vision
Establish Procedures function	High	Importance in relation to performance of core business, common procedures are necessary
Establish Roster planning function	Medium	Importance in relation to performance of core business, and optimal use of resources
Common Briefing officer resource pool	High	Importance for NUAC to perform core business
Common ATCO resource pool	High	Very important for NUAC to create a sustainable solution to have common core business
Night closure of control centres	Low	Not especially important with regards to NUAC core business or for the company to sustain
Purchasing and maintenance of administrative IT	Low	Not especially important with regards to NUAC core business or for the company to sustain
Alignment of sourcing of tele/data communication services	Medium	Technical cooperation supports a sustainable future proof solution
Purchasing and operation of standard ‘other ATM systems’	Medium	Technical cooperation supports a sustainable future proof solution
Alignment of use of existing surveillance infrastructure	Medium	Technical cooperation supports a sustainable future proof solution
Purchasing and operation of standard CNS systems	Medium	Technical cooperation supports a sustainable future proof solution
Alignment of use of existing basic and unit training simulators	Medium	Technical cooperation supports a sustainable future proof solution

Completion of the analysis

4) Conducting the analysis – Speed imperative score (5/5)

Initiative	Speed	Overall rationale
Establish company (legal entity)	High	Initially important to establish company since all other activities depend on this
Establish headquarters	High	In order for NUAC to support a common Business culture and foundation headquarter establishment is important
Implementation of New Airspace Design	High	Important to implement early for NUAC performing common core business and operation
Establish Certification	Medium	Important to establish prerequisites for core business cooperation as quickly as possible
Establish Designation	Medium	Important to establish prerequisites for core business cooperation as quickly as possible
Establish Management	High	In order for NUAC to support a common business culture and foundation management is important early in the integration
Establish HR function	Medium	Some need for fast establishment of common business support unit
Establish PR, Communication functions	Medium	Some need for fast establishment of common business support unit
Establish Finance function	Medium	Some need for fast establishment of common business support unit
Sourcing of Facility management	Low	Little imperative for speed since no connection to NUAC core business
Establish Q&S function	Medium	Important for implementation of new airspace design i.e. speed is important since airspace is important
Establish Legal services function	Medium	Some need for fast establishment of common business support unit in order to get a good business foundation
Establish ATM training function	Medium	Some need for fast establishment of common training coordination
Sourcing of Admin IT services	Low	Little imperative for speed since no connection to NUAC core business
Establish Business development function	Medium	Some need for fast establishment of common Business Development and strategy
Establish Tech. development function	Medium	Some need for fast establishment of common business support unit
Establish Tech. maintenance function	Medium	Some need for fast establishment of common business support unit
Establish Procedures function	High	Important for establishing implementing new airspace and common core business
Establish Roster planning function	Medium	Some importance for optimal use of ATCO resources
Common Briefing officer resource pool	High	Important for establishing common core business hence important to implement early
Common ATCO resource pool	High	Important for establishing common core business hence important to implement early
Night closure of control centres	Low	Little imperative for speed due to dependency to a large number of other initiatives, hence late integration
Purchasing and maintenance of administrative IT	Low	Little imperative for speed since no connection to NUAC core business
Alignment of sourcing of tele/data communication services	Low	Little imperative for speed since no connection to NUAC core business
Purchasing and operation of standard ‘other ATM systems’	Medium	Some need for fast integration/establishment of common technical solutions
Alignment of use of existing surveillance infrastructure	Medium	Some need for fast integration/establishment of common technical solutions
Purchasing and operation of standard CNS systems	Medium	Some need for fast integration/establishment of common technical solutions
Alignment of use of existing basic and unit training simulators	Medium	Some need for fast integration/establishment of common technical solutions

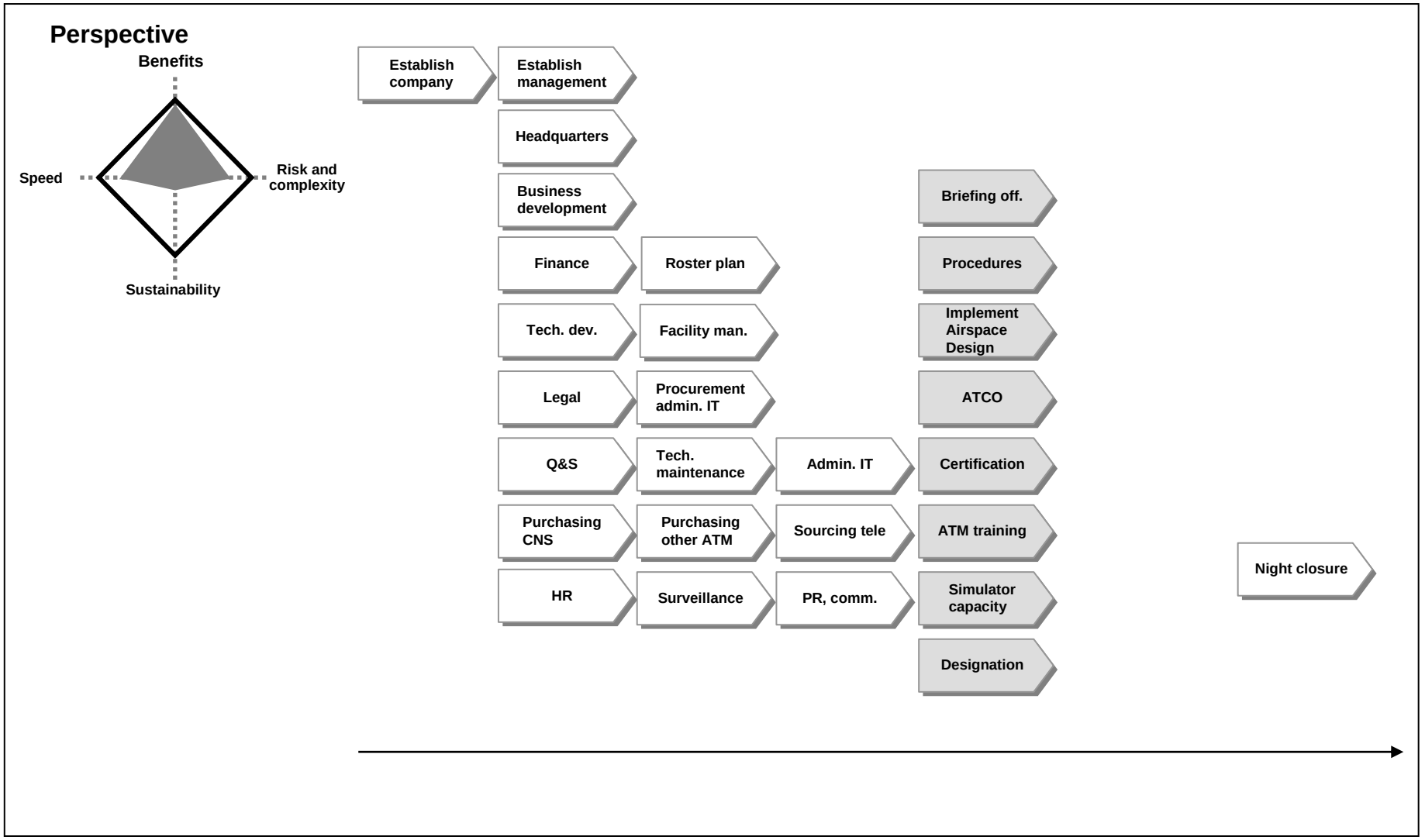
Completion of the analysis

5) Method for sequencing the Integration scheme

- As previously explained, the initiatives are analysed according to four overall criteria: Benefit, Risk/Complexity, Sustainability, and Speed. These scores are used to determine the timing of each of the initiatives in the integration scheme. In all suggested solutions, considerations regarding interdependencies between the initiatives are taken into account:
  - **Benefit** imperative suggests the earliest possible integration of initiatives with high benefits (financial or non-financial and socio-economic benefits)
  - **Risk/complexity** takes into account that less complex and risk implying initiatives might be implemented early in the project, compared to more complex and high-risk initiatives
  - **Sustainability** proposes that initiatives with high risks might be implemented early to create a change and thereby forcing the mitigation at a later stage not to create too much disturbance:
    - Sustainability is also important for initiatives which are core for the business, and it is necessary to focus on initiatives which instigate a more formal cooperation in order to create a sustainable solution
    - It is also taken into consideration that integration of too many initiatives at the same time might create too much disturbance and thereby not help create a sustainable solution
  - **Speed** implies implementing as much of the solution as early as possible to create an immediate change:
    - It is noted that the ATM business does not usually focus predominantly on speed since this imperative is difficult to apply due to thorough safety regulations etc. which need to be investigated before a change can be approved
- The Integration scheme with focus on each of the imperatives are shown on the next four pages, so that initiatives with the highest score should be implemented first.
- Finally an overall integration scheme has been constructed which focus mainly on Benefits and Risk/Complexity, suggesting that high benefit imposes some importance on the integration of each initiative, i.e. high benefit will also have some impact on the timing of the integration, but that initiatives with e.g. both high benefits and high risks must be balanced.

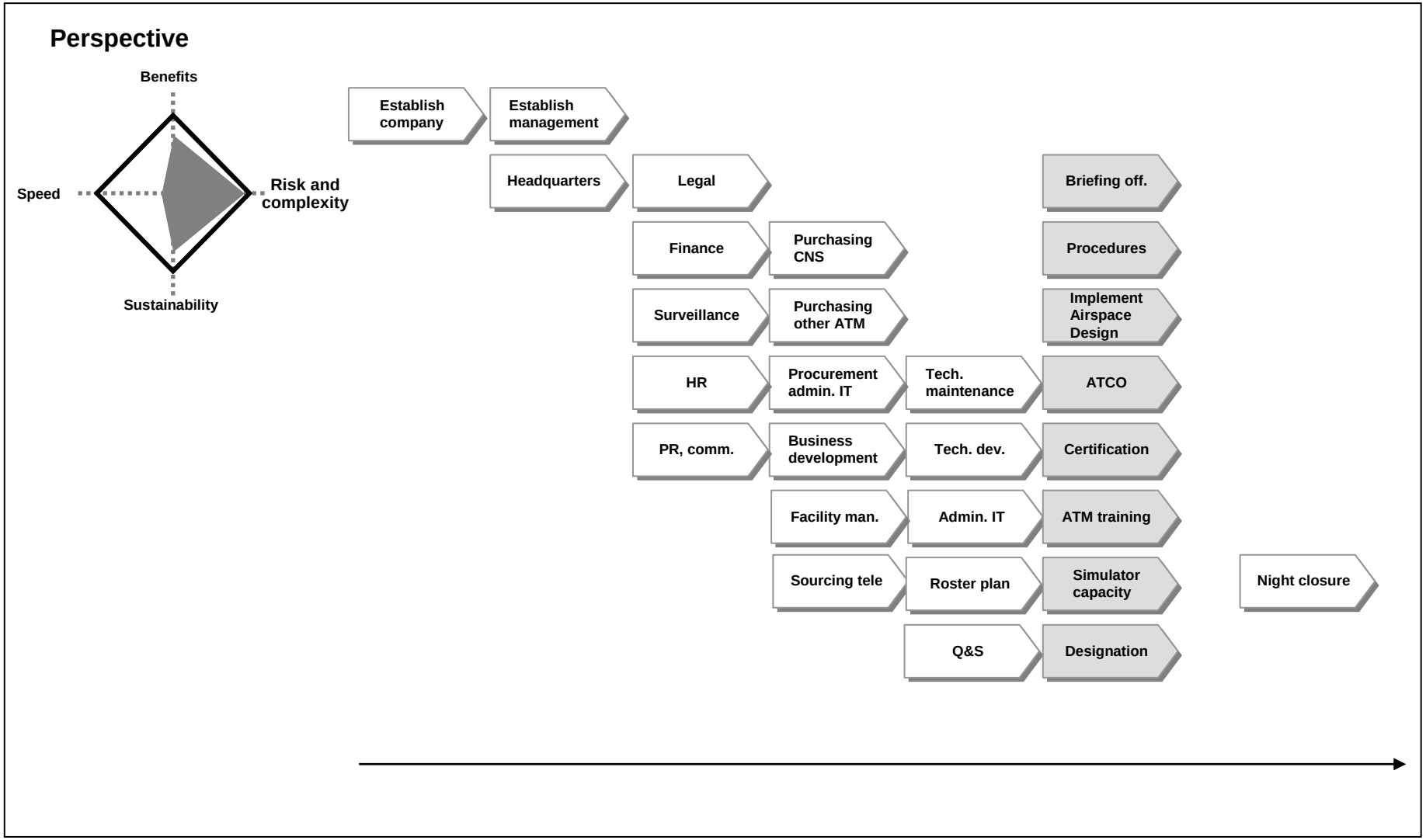
Completion of the analysis

5) Integration scheme – Benefit imperative



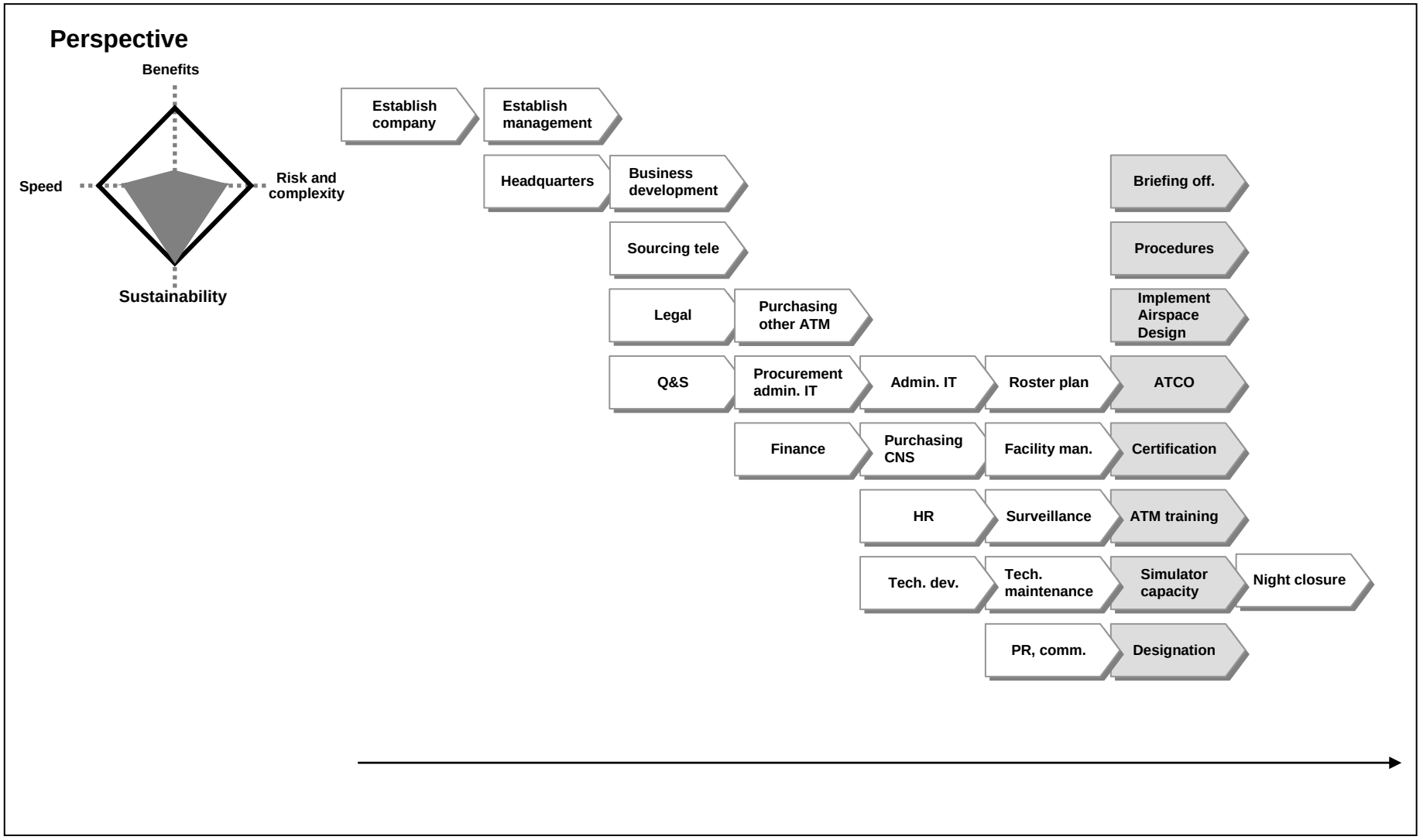
Completion of the analysis

5) Integration scheme – Risk/Complexity imperative



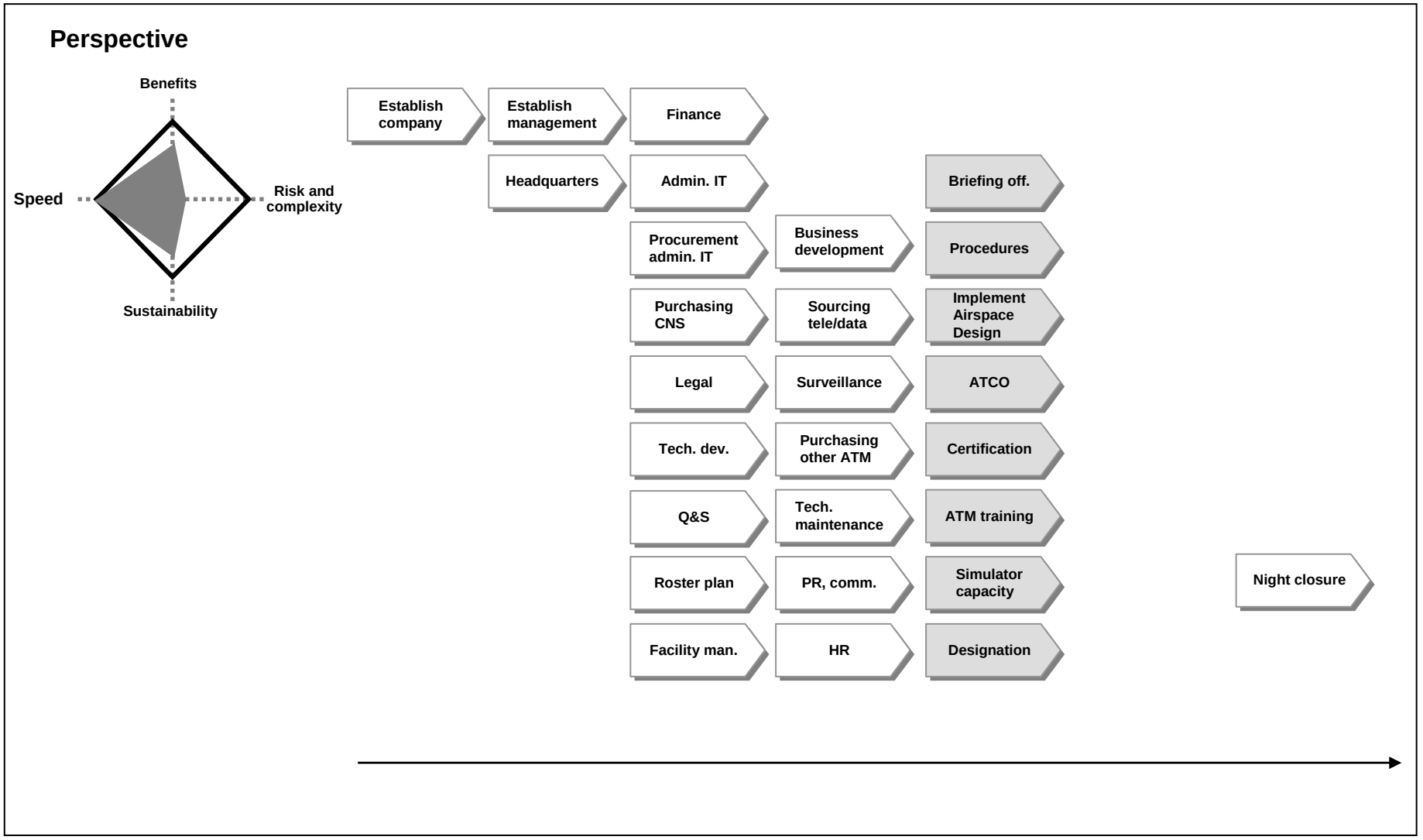
Completion of the analysis

5) Integration scheme – Sustainability imperative



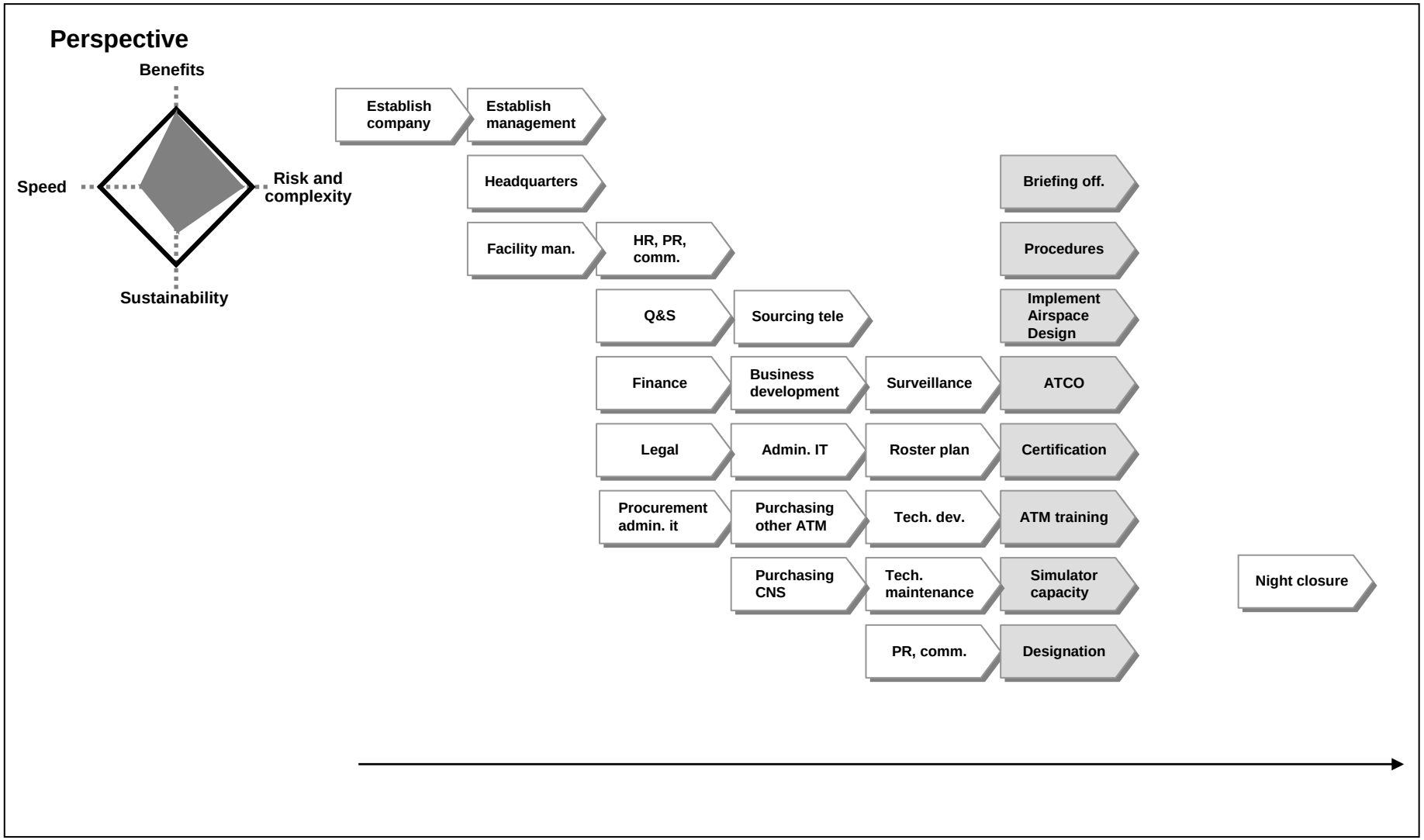
Completion of the analysis

5) Integration scheme – Speed imperative



Completion of the analysis

5) Integration scheme – overall (weighting the 4 perspectives)



Completion of the analysis

Comparison between the Integration schemes

To summarise differences and similarities of the four integration schemes:

- Initiatives can follow the same or almost the same sequencing in all four perspectives due to the interdependencies between the initiatives
- What might differ are the timescales, but whether that actually will be the case will only be revealed in the detailed planning process
- **Certification**, **Designation**, **ATM training, Training simulators**, **Procedures functions, ATCO functions**, **Briefing Officer function,** and **Implementation of New Airspace Design** need to be implemented simultaneously due to interdependencies
- Some initiatives differ in their position in the different integration schemes:
  - **Tech. development** and **Tech. maintenance** differ due to medium-high benefits and low-medium Risk/Complexity
  - **HR** differ in the placement due to e.g. medium benefits and medium importance with regards to sustainability
  - Due to low scores for most imperatives suggesting that timing of e.g. **Sourcing tele** and **PR and Communication** initiatives can be chosen more dynamically once considerations to more important initiatives have been taken
- The initial conclusion from the ongoing analysis is that even with different perspectives the hard dependencies between core initiatives suggest limited room for choosing between alternative integration roadmaps.

Completion of the analysis

Considerations regarding the integration scheme

- Benefit and Risk/Complexity model-based sequencing of the initiatives will in actual detailed integration planning be augmented by:
  - Relations between the initiatives and external dependencies:
    - Work relations/agreements and procedures, and roster planning
    - Regulatory directives and procedures
    - Initiatives in retained organisations
  - Available resources for implementation, necessary competencies etc.
  - System dependencies needed for the implementation
  - Initiatives of lesser importance from the benefit, and Risk/Complexity model perspective, such as e.g. administrative IT, might be important to address up-front because they are needed to facilitate the establishment of the NUAC Company from the very beginning
- It should be stressed that the Integration scheme is a logical order of integration, not a timetable; e.g. although roster planning and legal are in the same column meaning that they could be implemented in parallel at the same time, other outside dependencies might turn out to influence the order of integration.

Contents

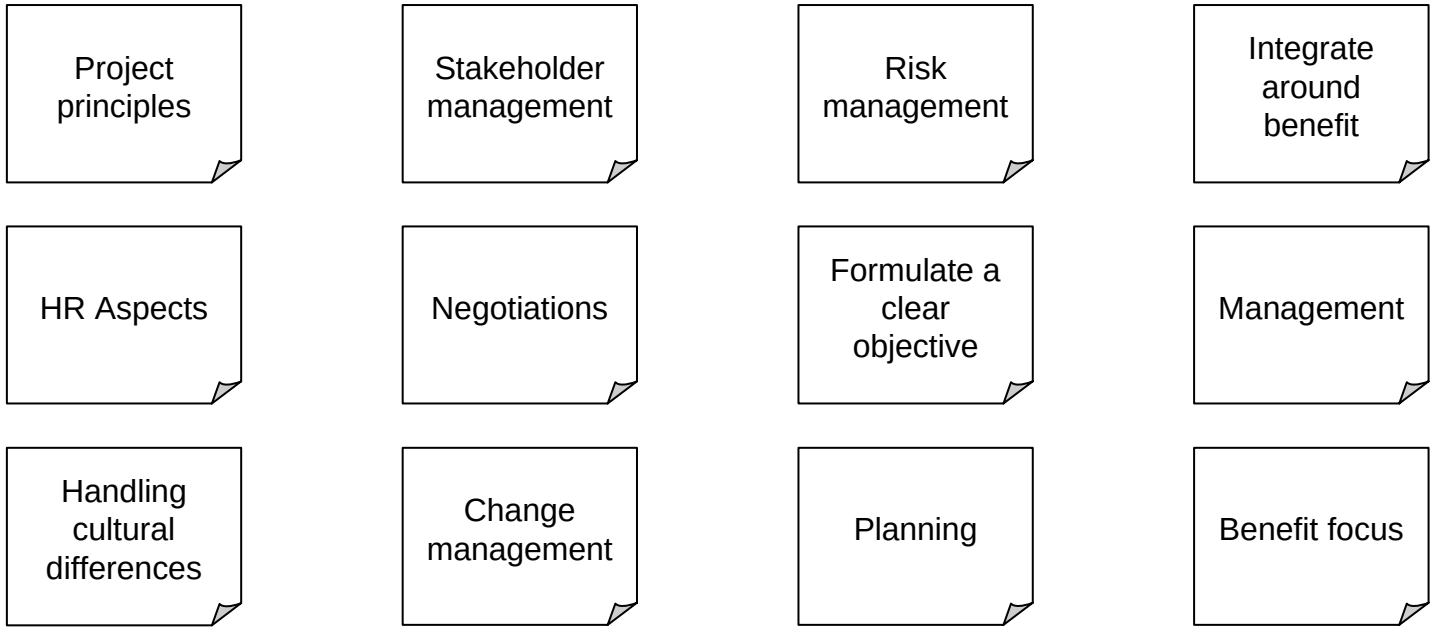
- Introduction
- Background
- Conclusions
- Design of initiative-based integration scheme
- Design of integration principles

Conclusion

Integration principles

- The integration principles* presented in NUAC Definition Phase Final Report are developed further through using the experiences from the latest integration projects in LFV/ANS and Naviair, e.g. Entry Point North and knowledge from cross-border merger projects in other industries
- Integration principles should provide strategic guidance in terms of concrete principles for the handling of the design and implementation phase for the NUAC Programme in order to ensure that the integration happens as efficiently as possible

Overview of the different integrations principles



*The principles are based on experiences in terms of integration projects from a) comparable industries, b) relevant change and implementation projects from the two organisations, and c) consolidation projects from the ATM industry

Conclusion

Integration principles

Project principles	• Focus integration around establishment of ANS core business • Align strategic ambition and IT activities with corporate and stakeholder direction
HR Aspects	• Enforce openness and communication
Handling cultural differences	• Primarily focus on HR and integration of different national cultures • Focus on culture, knowledge, processes, and architecture
Stakeholder management	• Involve stakeholders (especially internal) as much as necessary throughout the integration
Negotiations	• Involve owners early to begin negotiations • Define current and future relationships with business partners, trading partners, industry, and customers
Change management	• Make business integration a successful and efficient process for the organisations • Revisit and revise integration strategy if business strategy change
Risk management	• Mitigate integration risks immediately when identified • Focus on risks related to both internal and external supporting business units, infrastructures etc.
Formulate a clear objective	• Be clear on prioritisation regarding integration objectives • Drive the integration of business strategies, processes, and functions into a single business strategy
Planning	• Minimise redundancy by identifying the relevant involvement of staff, retain staff with the required knowledge and skills, while minimising the effect on daily business
Integrate around benefit	• Focus on integration areas that affect key benefit potential areas • Create metrics for measuring the effectiveness of the integration
Management	• Ensure strong alignment between NUAC, retained organisations, and regulators • Examine operational capabilities and management frameworks
Benefit focus	• Clearly focus on business benefits expected