Time-line concept for Collaborative Workflow Management in:

- **dynamic** Demand
- **DC** Capacity Balancing

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Operational Specifications & Requirements
Dynamic DCB in Brief

Today
- ETO-3h
- EOBT-30min
- TOT
- ATFCM
- ISOLATED FMP Actions
- ATC
- ETO-10min (?)
- ETO

2020
- ETO-3h
- EOBT-30min
- TOT
- DCB
- dynamic DCB
- MSP+ATC
- ETO-30min (?)
- ETO
Traffic Prediction (Occupancy Count) is the cornerstone to take decision with confidence.

MUAC Occupancy counts prediction error compared to entry counts prediction error

- **Occupancy counts**
- **Entry Counts**
- **Entry Counts + Std Dev**
- **Entry Counts - Std Dev**

MUAC entry sample: 14000 entries
MUAC occupancy sample: 5000 occupancies
What is dDCB?

Entry Counts
What is dDCB?

Occupancy counts
Entry versus Occupancy
Hourly Capacity Versus dDCB

Diagram showing the relationship between hourly capacity and dDCB complexity.
Concept Clarification
New process and procedures

- Detect
  - Monitor Entry/Occupancy
  - Criterias to identify Hotspot
  - Hot Spot Detected
  - Hot Spot Confirmed
  - Capture Hot Spots

- Analyse
  - Monitor and Analyse Traffic Complexity
  - Define STAM Measures
  - Criterias to define measures
  - Verify Hot Spot
  - Cancel Hot Spot

- Coordinate
  - STAM Coordination
  - STAM Measures
  - Critical Events
  - Coordinate
  - Escalate

- Implement
  - Promulgate STAM Measures
  - Implemented

- Analyse and Coordinate
  - STAM Measures Finished
  - Coordinated
  - Cancel STAM Measures
  - Escalated

- VerifHot Spots
  - STAM Coordination
  - Coordinated
  - Cancel STAM Measures
  - Escalated

- Network View
  - STAM Notification
  - Network View

- Concept Clarification
  - New process and procedures
Situation awareness
Network view: Hotspots

[Diagram showing traffic counts with highlighted hotspots]

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Situation awareness
Network view: Hotspots
STAM Scenarios
Scenario proposals for the P7.6.5 release one trial
With example operational work flow

4. Level cap, present an Aircraft into a different sector to that originally planned to solve a high demand/workload issue.

Example: a) LTMA departure routing via the Brussels sector family group
Capped out of Brussels High.
b) UK North departure routing via the DECO sector family group
capped out of DECO High.

Work Flow:

Initiate - Maastricht Flow Manager identifies a short period of excessive demand/workload within the Brussels sector family group at around T-1.5 to 1 hour. The FM then carries out an initial assessment to generate a list of potential dDCB solutions. The FM then initiates a “Hot Spot” to include the appropriate relevant actors in this instance UK FM.

Negotiate - Communication is initiated between the two FM’s and the potential dDCB solutions are discussed. The optimum solution is identified as a level cap scenario between the actors then the UK FM then performs a DCB analysis to assess viability, upon approval communication with the relevant AOC’s commences.

The AOC’s then perform a business analysis to assess viability (which may result in acceptance, scenario modification or new dDCB solutions being applied as appropriate).

Implement - The optimised solution is confirmed, at which point ownership of the solution transfers to the UK FM. Implementation is achieved when the dDCB plan has been effectively communicated and agreed with the relevant ATC actors within London (and potentially new flight plans have been filed or a level cap scenario restriction has been applied by the appropriate CASA position within DNM).
Identification of actors

Air Navigation Units model
3.2.4 Unit Classification overview

Figure UT-15: Unit Classification overview
3.2.1 Main

Figure UT-12: Main

This overview diagram shows the most important concepts and relationships within the Unit_Business domain.
3.16 AtcUnit

3.16.1 Description

(1) An AtcUnit is a Unit responsible for providing ATC (Air Traffic Control) services for an AtcUnitAirspace (Aua).
(2) Motivation:
(3) AtcUnit is a generic concept that groups related types of Units.

3.16.2 Structure

![Diagram of AtcUnit structure]

*Figure UT-21: AtcUnit*
3.2.3 Unit - Airspace overview

![UML Diagram]

Figure 3.2.3 Unit - Airspace overview
3.2.2 Unit - Aerodrome overview

Figure UT-23: Unit - Aerodrome overview
Figure UT-19: Aoa

Aoa: the AircraftOperatingAgency Unit represents the main office of an aircraft operator.
Aoro: an AircraftOperatorRplOffice is a department of an Aoa.
Aocc: an AircraftOperatorControlCentre is a centre for an Aoa.
Aocu: an AircraftOperatorControlUnit is a local office representing one Aircraft operator at an Aerodrome.
Hdla: a HandlingAgent is an agent acting on behalf of one or more Aoa.
3.7 Amc

3.7.1 Description

(1) An Amc is a Unit which is responsible for the opening and closure of routes to implement the Flexible Use of Airspace concept.

3.7.2 Structure

![Diagram of Amc relationship]

Figure UT-17: Amc
dDCB CDM process

Problem

Initiator

Enablers

CDM

Actors

Outcome
### AUA EDYYDUTA ATC Configuration at 14-09:45 / ATFCM

**Observed period**: Mon 14 Jan 2013

**For AUA or Cluster**: EDYYDUTA

#### ATC Configuration

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*Atc Configuration query finished with success*
Dash-Board

collaborative work to manage multitude of time-based actions

What-if
performance driven