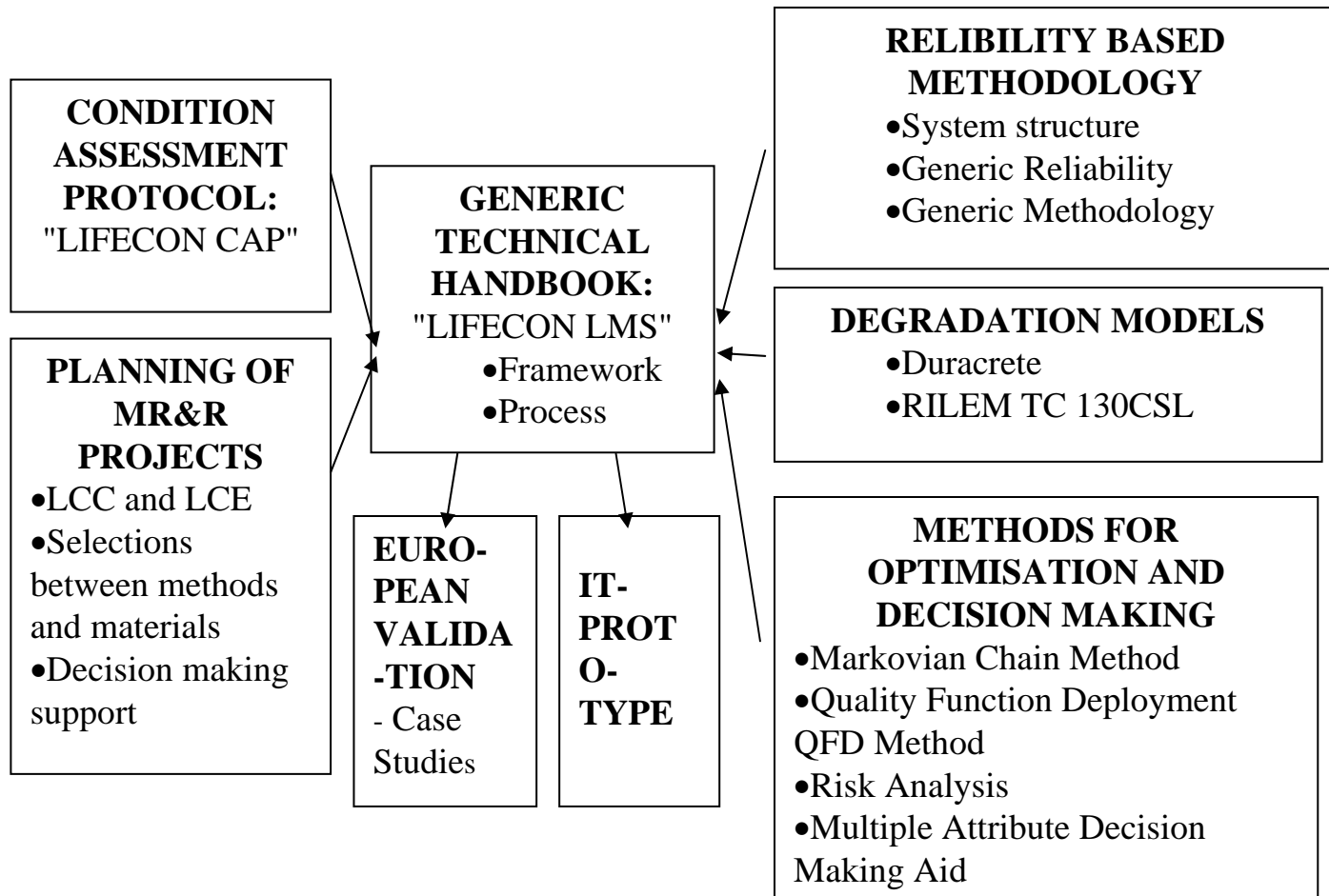
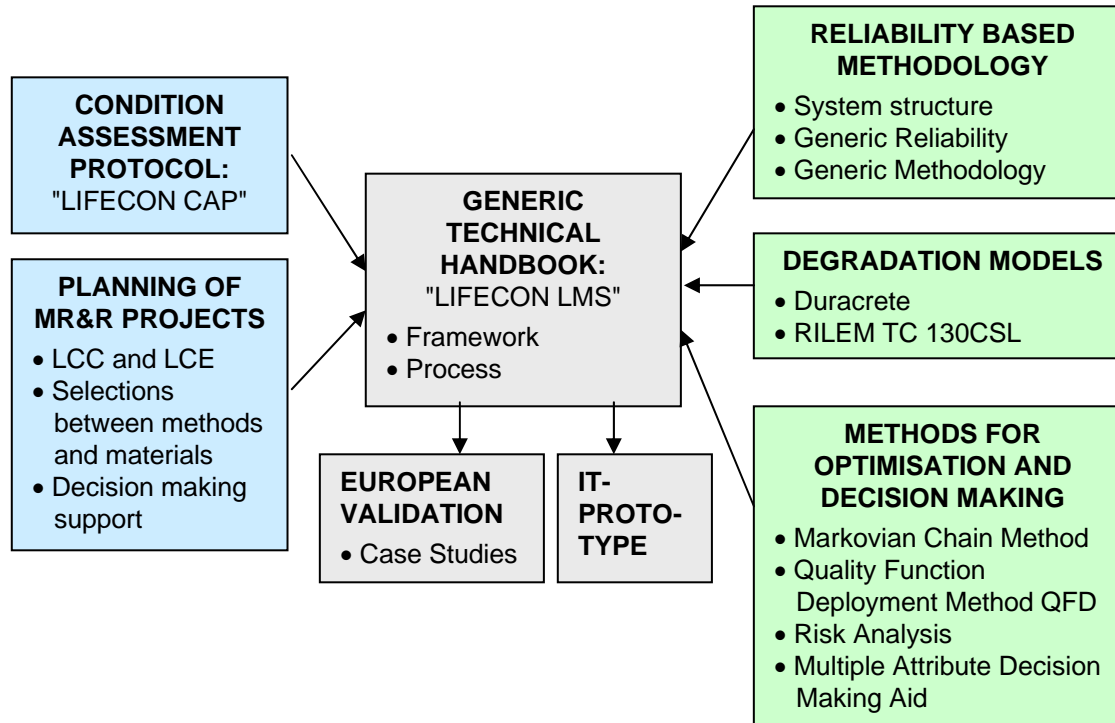


Lifecon Life Cycle management LMS SYSTEM



Lifecon Life Cycle management LMS SYSTEM



Basic Characteristics of LIFECON LMS

1. Generic

can be applied for any kind of concrete infrastructures
new program modules can be easily added
different degradation models can be used

2. Integrated

integrated two level system harmonising the object level
work programme with the network level optimum
different matters can be taken into account in the
decision making process

3. Probabilistic

mathematical solutions are based on probabilistic methods with
probabilistic degradation and repair models

General Characteristics of LIFECON Framework

LIFECON LMS consists of three separate systems:

1. Object Level System

yearly MR&R projects based on inspection and condition assessment

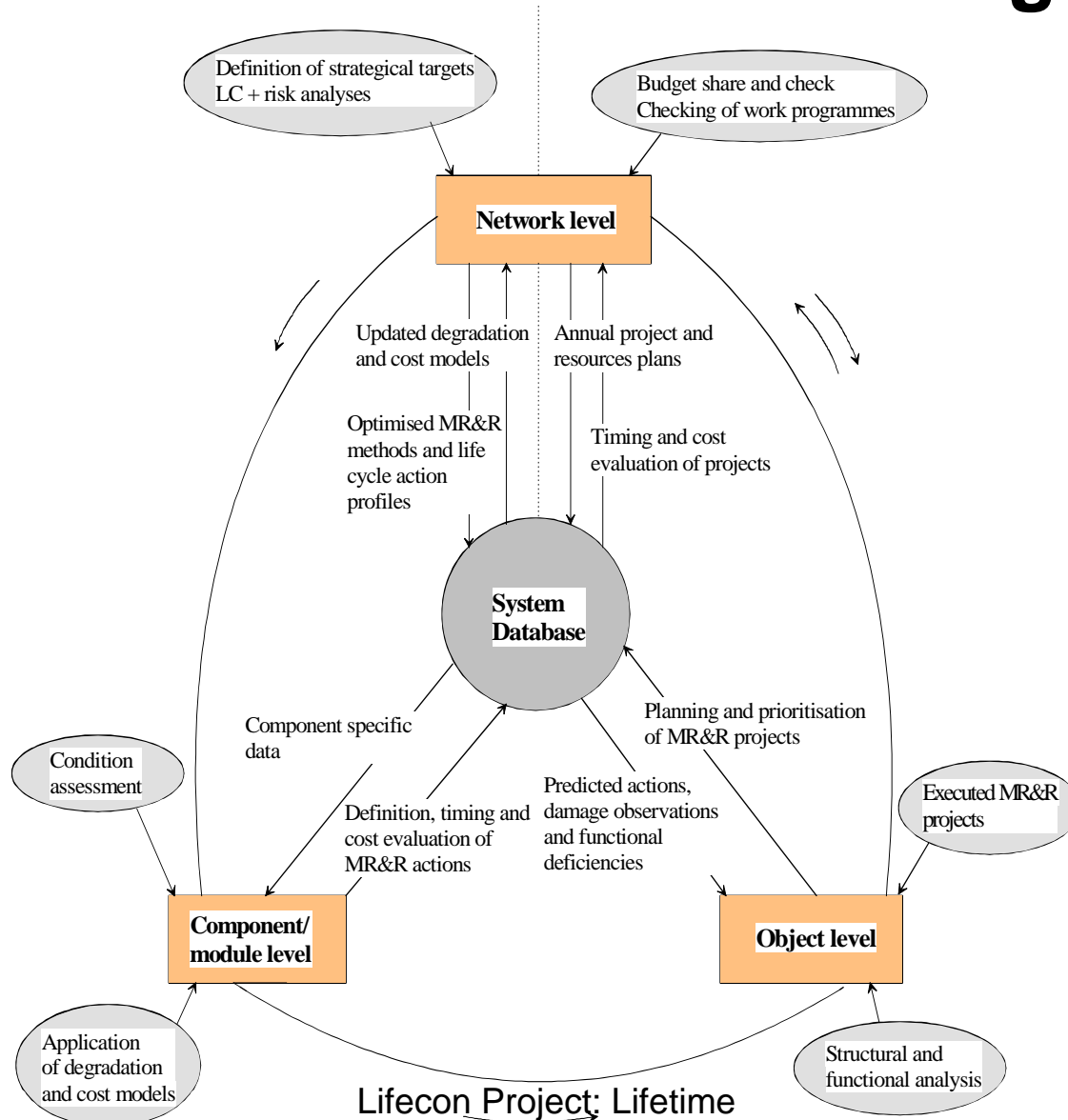
2. Network Level System

long and short term operative planning and decision making

3. Network and Object Level System

integrated two level system harmonising the object level work programme with the network level optimum

LIFECON Decision Making



LIFECON Levels of Decision

The structures are divided into three levels of structural hierarchy:

1. Component/module level

structural components e.g. beams, columns,
combined modules

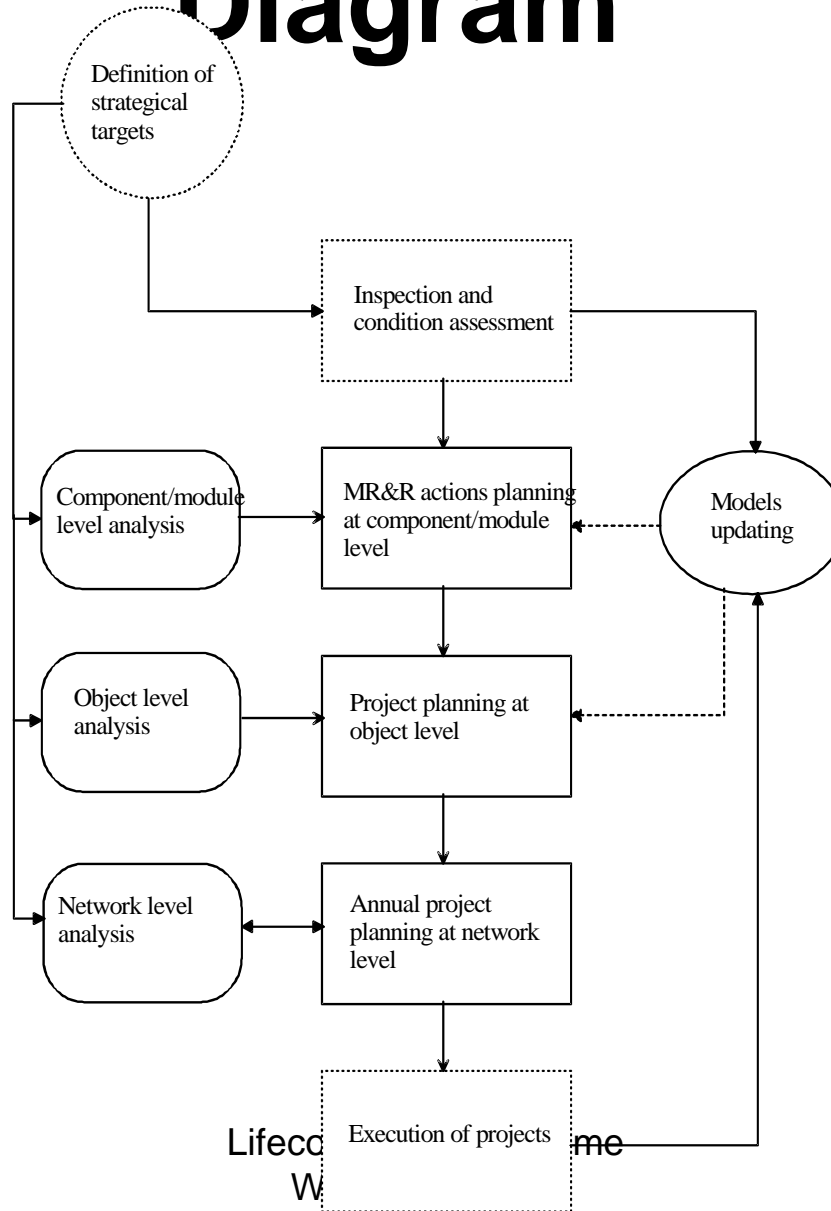
2. Object level

complete structures or buildings

3. Network level

networks of objects e.g. stocks of bridges or
buildings

LIFECON Operational Flow Diagram



Main Processes of LIFECON LMS 1/3

1. Administrative Inputs

Definition of strategic targets

2. Analyses

Life cycle and risk analyses

Markov chain long term analysis

Structural and functional analyses

Budget share analyses

Revision of decision trees of LCAPs

Preliminary rehabilitation planning

Main Processes of LIFECON LMS 2/3

3. Planning of MR&R Actions

Markov chain short term analysis

Definition of budget limits and optimal MR&R action distributions

Definition of MR&R actions

Timing of actions and evaluation of action costs

Entering the rehabilitation plans into database

4. Planning of Projects

Harmonising the action distributions with the network level optimum

Recalculation of action distributions from proposed work programmes

Combining MR&R actions into object based groups

Sorting of the proposed objects into budget categories

Priorisation of proposed objects in budget categories

Planning of projects

Detailed planning of projects and preparation of contract documents

Main Processes of LIFECON LMS 3/3

5. Preparation of Annual Work Plans

Budget share into budget categories

Priorisation of projects and budget check

Preparation of annual project and resources plans

6. Data Collection and Modelling

Inspection and condition assessment

Updating of degradation and cost models

Project execution

Mathematical Methods of LIFECON LMS

Markov Chain Method

Probabilistic approach to degradation and repair action modelling

Multi-Attribute Decision Aid MADA

Consideration of many objectives at the same time

Quality Function Deployment QFD

Examination of correlation and relative importance of different objectives

Different Risk Analyses Methods