2

APPROACH
&
METHODOLOGY

02 - Phasing
03 - Explanation of the approach
04 - Example of phase 1 approach
07 - Phase 1 scanning
08 - Plan
09 - Plan / Data
11 - Methods
12 - Logistics
PROJECT APPROACH: PHASING
Grouping of phases according to need

THE PHASING OF AN INDUSTRIAL PROJECT (*)

**PHASE 0**
COMPANY OBJECTIVE INDUSTRIAL APPROACH
Feasibility
Internal or external

**PHASE 1**
PRE-ENGINEERING
Data + Objectives = Analysis
Simulations
Development
Financial estimates
Call for tender TS

**PHASE 2**
PROPOSAL
Supplier documentation
Detailed development
Editing of supplier documentation
Outside order TS
Internal specifications

**PHASE 3**
PRODUCTION DOCUMENTATION
Incorporating of the site’s constraints
Defining of the procedure’s inferred tasks.
Inferred organization
Updating of anticipated layout
Internal specifications

**PHASE 4**
PRODUCTION
Supplier follow -up
S/C engineering follow -up
S/C production follow -up
Supplier acceptance tests

**PHASE 5**
IMPLEMENTATION
Physical system
Assembly
Tests
Acceptance

**PHASE 6**
OPERATING
Physical system
Human resources
Operating plan
Procedures
JIT- work-in-process
Quality plan …

R & D
Master plan or strategy
Plants - Lines - Units
Equipment
Reorganization

GPD
(General preliminary design)

DPD
(Detailed preliminary design)

PP
(Detailed preliminary design)

PROJECTION COHERENCE
Solution coherence
Master plan coherence

* : This breakdown is normative and excludes any assumptions about needs.
PROJECT APPROACH: THE TARGET

PROJECT SEQUENCE

ESTABLISHING OF THE TARGET
INVENTORY / DATA
ANALYSIS & SIMULATION
INTERPRETATION
DIAGNOSIS or VISION
COHERENCE / OBJECTIVE
ACTION PLAN
IMPLEMENTATION
FOLLOW-UP & COHERENCE
OPERATING

TARGET

OBJECTIVE

CURRENT

PERFORMANCES

ECONOMIC ACTIONS

OPTIMIZATION

• Technical
• Resources
• Economic

OBJECT OF OUR KNOW-HOW

Ph 1
Ph 1
Ph 1
Ph 1
Ph 1
Ph 2 - Ph 3 - Ph 4
Ph 5
Ph 4 & Ph 5
Ph 6
PROJECT APPROACH: PHASING

THE METHODOLOGIES APPLIED TO THE PHASES ARE DEVELOPMENTS SPECIFIC TO EACH PROJECT.

THE DESCRIPTION OF THESE PHASES REQUIRES A PRESENTATION THAT IS ADAPTED TO THE FIELD OF APPLICATION, THE COMPANY’S ORGANIZATION AND THE PLANT CONTACT PEOPLE:

- GENERAL MANAGEMENT
- HUMAN RESOURCE DEPARTMENT
- SALES DEPARTMENT
- INDUSTRIAL DEPARTMENT
- ENGINEERING DEPARTMENT
- PRODUCTION (or Sector Production) DEPARTMENT
- DEVELOPMENT - METHODS - INDUSTRIAL ENGINEERING - R & D DEPARTMENT
- INTERNAL LOGISTICS (Infrastructures & resources)
- PURCHASING DEPARTMENT
- QUALITY DEPARTMENT
- MAINTENANCE DEPARTMENT
- TRAINING DEPARTMENT
- .......................

SEE THE DOCUMENTATION GIVING PRESENTATION EXAMPLES.

_______________________________________________________________________

A SPECIFIC PRESENTATION MAY BE CREATED DEPENDING ON THE PROJECTS’ OBJECTIVES AND DEGREE OF URGENCY.

_______________________________________________________________________

THE FOLLOWING ILLUSTRATES THE DESIGN APPROACH (PHASE 1 EXAMPLE)

This approach is given by way of example and excludes any assumptions about needs.

The following 3 pages present the analysis and design method for phase 1 (preliminary design)

- ANTICIPATED SEQUENCE OF THE PRELIMINARY DESIGN PHASE. Translation into
- DATABASE ORGANIZATION MATRIX (A) - PRELIMINARY DESIGN PHASE
- FUNCTIONAL MATRIX (B) OF A PHYSICAL SYSTEM - PRELIMINARY DESIGN PHASE
- INTER-MATRIX SCANING FOR THE ANALYSIS PHASE. DESIGN PHASE DATABASE
**PROJECT APPROACH: THE TARGET**

**PHASE 1 METHODOLOGY** (general organization)*

Simplified chronological presentation

- UNDERSTANDING
  - BASIC DATA
    - PRODUCT
    - RESOURCES
    - ORGANIZATION
- ANALYSIS OF SOLUTION SEARCH
  - CHOOSING OF SOLUTIONS
  - TECHNICAL/ECONOMIC ANALYSIS
- CHOOSEING OF THE FINAL SOLUTION
- DEVELOPMENT OF THE SOLUTION ADOPTED
- PREPARATORY MEETING
  - ANALYSIS OF OBJECTIVES
  - INVENTORY OF CONSTRAINTS
  - BREAKDOWN OF FUNCTIONS
  - TECHNICAL INFORMATION ABOUT THE PROJECT
  - DESIGNS AND INNOVATIONS
  - INFORMATION ABOUT COSTS
  - TECHNICAL LAYOUT ANALYSIS
  - SIMULATIONS & CHOOSING OF A SOLUTION
  - STRUCTURE OF DOCUMENTATION
  - FINANCIAL ESTIMATE
  - UPDATING OF TECHNICAL DOCUMENTATION
  - GENERAL PLAN
  - PHYSICAL SYSTEM SPECIFICATIONS
  - SPECIAL SPECIFICATIONS
- GATHERING OF BASIC DATA
  - SP DATABASE
  - PROCEDURE DOCUMENTATION
  - DOCUMENTS & PLANS ISSUED
  - FEASIBILITY DOCUMENTATION
  - CALL FOR TENDER
  - FUNCTIONAL SPECIFICATIONS
  - SP DATABASE
  - GENERAL PLAN
  - PHYSICAL SYSTEM SPECIFICATIONS
  - SPECIAL SPECIFICATIONS
- INTERNAL DOCUMENTATION
- EXTERNAL CALLS FOR TENDER

(*) This approach is given by way of example and excludes any assumptions about needs (general approach to be used as a model).
PROJECT APPROACH: PHASING

PHASE 1 METHODOLOGY (general organization)*
Matrix presentation

UNDERSTANDING
- ANALYSIS OF THE OBJECTIVES
- PRODUCTS
- PRODUCT CONSTRAINTS
- PRODUCT VARIANTS
- PROCEDURE CONSTRAINTS
- PRODUCTION PROGRAM
- PROJECT TECHNIQUES
- EXISTING ORGANIZATION
- ASSOCIATED MP RESOURCES
- INVENTORY OF OTHER CONSTRAINTS

ANALYSIS & SEARCH FOR SOLUTIONS
- BREAKDOWN OF DEVELOPMENT PLAN FUNCTIONS
- FAMILIES
- SUB-ASSEMBLY POLICY
- NOTION OF BATCHES
  Yes - No
- MANUFACTURING SEQUENCES
- TASK SEQUENCE
- CALCULATION OF TIMES
- ANALYSIS OF KNOWN SOLUTIONS
- AUDIT
- DESIGNING OF INNOVATIONS

ECONOMIC TECHNICAL ANALYSIS
- LINK AND CIMH TECHNICAL ANALYSIS
- SIMULATION FLOW
- GEOGRAPHIC GROUPING / Yes - No
- CYCLE SIMULATION
- PROCEDURE CONSTRAINTS
- 1 x 8 & 2 x 8 VARIABLES
  D & N & FSS
- PRODUCTIVITY APPROACH LEVEL OF AUTOMATION
- INCORPORATING OF INVARIANTS
- ASSUMPTIONS ACCORDING TO VARIABLES
- ANTICIPATED ARCHITECTURE

DEVELOPMENT OF THE SOLUTION ADOPTED
- UPDATING OF THE TECHNICAL DOCUMENTATION
- ALIGNMENTS & SCABABILITY CONSTRAINTS
- NOTION OF KITTING
- FLEXIBILITY OF THE AVAILABLE RESOURCES
- FUNCTIONAL SPECIFICATIONS
- PRODUCTION CONSTRAINTS
- AUTOMATIC OPERATION SPECIFICATIONS
- SPECIAL SPECIFICATIONS
- ORGANIZATION & OPERATING METHOD
- EQUIPMENT PLAN ARCHITECTURE
- CALL FOR TENDER FUNCTIONAL SPECIFICATIONS
- INTERNAL INFORMATION

(*) This approach is given by way of example and excludes any assumptions about needs (general approach to be used as a model).
PROJECT APPROACH: PHASING

PHASE 1 METHODOLOGY (general organization)*
Matrix presentation
FUNCTIONAL MATRIX OF A PHYSICAL SYSTEM

ARRIVAL OF MATERIAL(S)
- WAREHOUSE
- STORAGE METHOD
- OPTIONS
- PACKAGING
- TRANSPORT METHOD

PRODUCTION FUNCTIONS
- FURNACE (Queue)
  - Dimensioning
- HANDLER
- PRESS
- BENCH
- CUTTING
- AUTOMATIC OPERATION
  - LEVEL OF AUTOMATIC OPERATION

RELATED FUNCTIONS
- PUTTING INTO OPERATION
- DISTRIBUTION
- SPRAYING
- TRANSFERRING OF TOOLS
- TOOLING
- TRANSFERRING OF TOOLS
- EXTRACTION OF WASTE

DEPARTMENTS AFFECTED
- PLANNING
  - WAREHOUSE-PURCHASING
  - METHODS
    - PRODUCTION
      - ENGINEERING OFFICE
    - TOOLING
    - QUALITY
    - MAINTENANCE
  - INFORMATION SYSTEM
- HR
- ORGANIZATION & OPERATING METHOD

(*) This approach is given by way of example and excludes any assumptions about needs (general approach to be used as a model).
PHASE 1 METHODOLOGY (general organization)

Relations between matrices

**ANALYSIS THROUGH HORIZONTAL SCANNING**
between organization module & physical system function

**LEVEL 1**
DESIGNING & TOP-DOWN ANALYSIS

**FUNCTIONAL MATRIX**
Scalability

Case of a new process
Case of the existing process

**ORGANIZATION MATRIX**

**MACRO LEVEL**

**EXPRESSION OF CONSTRAINTS**

**DETAILED LEVEL**

EXPRESSION OF MANUFACTURERS (Sub-contractors) or EXRESSION OF EXISTING ELEMENTS

**Examples:**
Effect: ..........................>
Effect: ..........................>
Concept: ..........................
Repercussions: .................>
Repercussions: .................>

**Matrix:**
Of the batch concept
Of the working time/D
Of the Physical system
Of the level of automatic operation
Of the operating method

**Matrix:**

S.P. DATABASE & FILES

BASIC DATA & ANALYSIS

DESIGN SOLUTIONS DEVELOPMENT

**METHODS**
- SMED (Single-Minute Exchange of Die)
- OTED (One-Touch Exchange of Die)
- P.Y. Poka Yoke (Zero Fault)
- DFA (Design for Assembly)
- AEM (Assemblability Evaluation Method)
- FMECA (Failure Mode Effects and Criticality Analysis)
- NEURONE - Simulation Analysis Modeling (S.P. Methods)

**TECHNIQUES / PROJECT**
- Mechanical
- Warehousing carrier
- Tooling
- Transfers
- Automatic operation
- Press
- CIMH
- Handling
- Network
- Training
- Network
- Training

Examples:

- Of the batch concept
- Of the working time/D
- Of the Physical system
- Of the level of automatic operation
- Of the operating method

- CASE OF A NEW PROCESS

- CASE OF THE EXISTING PROCESS

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PROJECT APPROACH: Taking into account of the data

ANALYSIS & DESIGN METHODOLOGY

THE COMPANY’S FIELD

FAMILIES OF PARTS & S/A

AREA OF ACTIVITY

RESOURCES

FUNCTIONAL OPERATIONS

STANDARD SEQUENCES(s)

FLOW PROCESSES

LAYOUT

Analysis of floor areas & distribution

<table>
<thead>
<tr>
<th>Human Resources</th>
<th>Planning</th>
<th>Quality</th>
<th>Monitoring of Performances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product engineering</td>
<td>Ergonomics</td>
<td>Maintenance</td>
<td>Info. system</td>
</tr>
<tr>
<td></td>
<td>Production</td>
<td>Methods</td>
<td>Purchasing logistics</td>
</tr>
</tbody>
</table>

MASTER PLAN

- Product inter-line
- Inter-workshop or building
- Inter-site

PRODUCTS & PRODUCTION TYPES

- Homogeneousness
- "procedure batches"

Necessary skills/production by workshop, line, unit, etc

Appropriateness of production tool & human resources

Process phases / BP family, S/A & Assemblies

Summary of phases (objective:.....% integrated)

Homogeneousness & transferring between sites

- Positioning of the procedure’s resources
  * compliance with the uni-directional flow
  * while integrating within the location’s constraints
  * while integrating within a new floor area

- use of resources
- defining of peripherals
- defining of tests

- Summary of phases (objective:.....% integrated)
PROJECT APPROACH: ANALYSIS & DESIGN METHODOLOGY

Taking into account of the data

- Products: THE COMPANY’S FIELD - Products and types
  - Basic parts
  - Sub-assemblies
  - Finished products and the constraints specific to them
  Such as:
  - dimensions - quality, handiness
  - capability
  - origin
  - variables
  - Other constraints

- Operating sequences
  - assembly
  - control
  - testing
  - trying out

- Areas of activity. Necessary skills by workshop, line, unit, etc
- Resources
  - invariant
  - new
  - withdrawn
  - originating from other sites

- Flows
  - incoming
  - current
  - outgoing
  - buffers
  - provisioning of preparation stations, chain, etc
  - roller cabinets or kit from the warehouses
  - partner and sub-contractor origins, shipping to partners and sub-contractors.

- Functional operations
  - Basic parts
  - Sub-assemblies
  - Assembly.

Product inter-line
Inter-workshop or building
Inter-site

INDUSTRIAL APPROACH
or POSITIONING
or REPOSITIONING
of the COMPANY
or COMPANIES

APPROPRIATENESS OF RESOURCES TO PRODUCTS

SUMMARY OF PHASES
OBJECTIVE
---% INTEGRATED

APPROPRIATENESS OF PRODUCTION TOOLS & HUMAN RESOURCES

APPROPRIATE INTER-UNIT
INTER-WORKSHOP
INTER-SITE CIMH

PROCESS PHASES BY FAMILY

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DOS-COM-SP
### PROJECT APPROACH: ANALYSIS & DESIGN METHODOLOGY

**Taking into account of the data**

<table>
<thead>
<tr>
<th>Transferring of products</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>- type</td>
<td></td>
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<tr>
<td>- location</td>
<td></td>
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<tr>
<td>- frequency</td>
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</table>

<table>
<thead>
<tr>
<th>The control system’s needs</th>
<th></th>
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<tbody>
<tr>
<td>- internal to a unit</td>
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<tr>
<td>- external connection to the unit</td>
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<tr>
<td>- inter-unit connection</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Stations and equipment</th>
<th></th>
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<tbody>
<tr>
<td>- anticipated technique</td>
<td></td>
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<tr>
<td>- value analysis</td>
<td></td>
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<tr>
<td>- innovative techniques</td>
<td></td>
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<tr>
<td>- level of automatic operation</td>
<td></td>
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<tr>
<td>- decision-making matrices</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Handling equipment</th>
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<tbody>
<tr>
<td>- static equipment</td>
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<tr>
<td>- dynamic equipment</td>
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<thead>
<tr>
<th>Staff</th>
<th></th>
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<tbody>
<tr>
<td>- qualification</td>
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<tr>
<td>- quality</td>
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<tr>
<td>- multi-facetedness</td>
<td></td>
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<tr>
<td>- working hours</td>
<td></td>
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<tr>
<td>- training</td>
<td></td>
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<tr>
<td>- payment system</td>
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</table>

<table>
<thead>
<tr>
<th>The analysis also covers the inter-unit interfaces</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>- loading</td>
<td></td>
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<tr>
<td>- unloading</td>
<td></td>
</tr>
<tr>
<td>- preparation stations</td>
<td></td>
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<tr>
<td>- sub-assembly and kit allocating area</td>
<td></td>
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<tr>
<td>- anticipated structure of stacking stillages</td>
<td></td>
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<tr>
<td>- capability</td>
<td></td>
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<tr>
<td>- mechanization</td>
<td></td>
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<tr>
<td>- indexing</td>
<td></td>
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<tr>
<td>- pallettization</td>
<td></td>
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<tr>
<td>- checking of position</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Buildings: organizational aspect according to the variant assumptions:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>- inventory, basic floor areas, free floor areas</td>
<td></td>
</tr>
<tr>
<td>- reuse, rehabilitation, building...</td>
<td></td>
</tr>
</tbody>
</table>

**Harmonization & Standardization**

**Examples of Projects Architectures**

- Product inter-line
- Inter-workshop or building
- Inter-site

**Notion of Kitting**

**Production Management Indicators & Associated Management**

**Compliance with the Uni-directional Flow**

**Appropriate Handling**

**Assurance of fluidity**

**Appropriateness of the Production Tools & Human Resources**

**Staff Audit Motivation**

**On Site & Inter-site Logistics**

**Useful Production Floor Areas & HR**

While integrating within the locations’ constraints

While integrating within a new floor area
Document to be explained during our visit.
Dealing with a project requires an applied and specific approach according to need.
PROJECT LOGISTICS

In the interests of close cooperation with the companies’ staff, the S.P. team collects data and performs research on site.

The company SECTEUR PRODUCTIQUE provides, for the project concerned:

- human resources
- computer equipment
- appropriate software and simulators
- specialized documentation
- applied and personalized methods.

Depending on the project.

STANDARD SERVICE CONFIGURATION

*Telecom NETWORK*

*Apple Talk Network (Set up by SP) used for the project*

*Telephone N° of the SP room (on site)*

*SP MODEM on site*  
*SP FAX (optional)*

*SP MODEM on other sites connection/simulators*

*COMPUTER*  
*COMPUTER*  
*COMPUTER*

*PHOTO & VIDEO TRANSFER*

*BACKUP*

*PRINTERS*

*Color PRINTER*

*BENSON 1210 X1 410 TRACING MACHINE*

*A3 - A4 SCANNER*