

# Software Specification Overview

for June 2003 version<sup>1</sup> of

## P+M / Staff Monitoring Tool

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### 1 Introduction

#### 1.1 Purpose

The first version of the P+M planning and monitoring tool aims to provide web-based reporting functionality to assist Divisional & Sectorial Planning Officers with the recurrent decision making process regarding overall HR actions in the context of P+M and the Human Resources Plan, as well as providing a longer term view of the Human Resources potential, associated cost estimations and potential deviations from the HR plan or other guidelines.

The framework is given by the HR plan. Items to be followed up are:

- Divisional personnel ceilings, as from now based on CHF with the possibility of translation into FTEs.
- Skills (professional categories): a certain mix between professional categories has to be reached by division. Note that the mix might differ from one division to another (see HR Plan).
- Contract policy: The distribution between long-term and short-term contracts has to follow the overall guidelines.

The tool should provide an estimation as precise as possible on the mid-term and long-term (10 years) for finance, contracts and skills. The conformity to the budget of at least the current and the following year is crucial<sup>2</sup>.

#### 1.2 Intended Audience

This document is intended for Division Leaders, Divisional Planning Officers, Sectorial Planning Officers, Directorate, the potential user community of the tool and the HRRB subgroup. The tool is intended initially for limited use to DPOs, SPOs, FI, HR & Strategic Planning (DSU).

#### 1.3 Product Scope

The goal of the tool is to assist in the decision making process related to re-hiring, recruitment, contract renewal and contract extension in the context of P+M and under the guidelines set out in the HR Plan. Currently there exist several ad-hoc tools whose implementation & functionality varies across divisions. There also exists a central HR tool for staff complements and a central FI tool for Personnel Budget, long-term simulations and measuring the financial impact of proposed new HR policies. The purpose of this tool is to provide a common unified view in order to provide a measurable basis upon which decisions are taken, and to ensure such decisions are taken within the financial and policy constraints applicable. (See Ref [3] for more info)

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<sup>1</sup> Disclaimer. The June 2003 version is the first available prototype. This specification is based upon the user requirements as described by the HRRB sub-group. Details are subject to refinement & change as a function of adherence to the model and/or validation of the results.

<sup>2</sup> Just as CET is a tool to assist conformity to the materials budget, this tool has the objective of assisting the decision maker in conforming to the personnel budget. Budget Conformity in itself is not guaranteed by the tool.

## 2 Product Perspective

Figure 2.1 provides an overview of the components of the system. These components are described below.

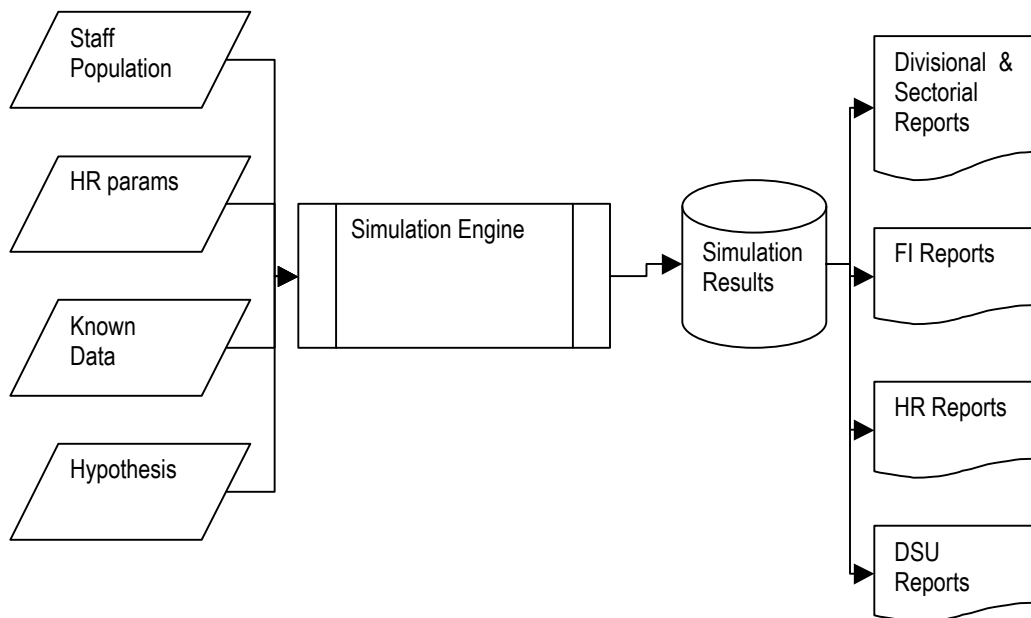


Figure 2.1 Overview of System Components

### 2.1 Staff Population (required data)

This is the current known contractual data of the staff population as maintained by HR division in the Oracle HR application, and verifiable via the HRT application. For the purposes of this tool, the required data includes :

- Name, Date of Birth, CernId, Budget Code, PPA, Sub-PPA,
- Org (div,grp,sct), Recharging Cost Centre, Working hours,
- Career Path, Grade+Step, Prof Cat, Contract Type,
- Contractual Start & End Date, Max possible End Date, Date Having 35 years in Pension Fund
- Special circumstances : Unpaid Leave (Start & End Date), PRP (start & end date), Admin Circular 22

### 2.2 HR Parameters

These are 'CERN' constants such as :

- Budgets (Ceilings) in CHF<sup>3</sup>

<sup>3</sup> Ceilings in FTEs will cease to exist as they will be replaced by Budgets in CHF.

- Overhead Factor to be applied when translating to 'standard costs'

These constants will be maintained by the central services (FI, HR & DSU)

## 2.3 Known Data

This is the current known data of recorded in Oracle HR and having potential impact on the staff population :

- Published Vacancies (requiring org-unit, budget code/PPA & Sub-PPA, grade+step<sup>4</sup>, prof cat, recharging cost centre & identification of rehiring vacancies)
- Arrivals, Transfers & Departures (including departure reason)
- Future Contract Type Changes

Today vacancy notices stored in OHR do not have all the necessary data available for them to be directly incorporated into the simulation data, therefore the missing data must be provided for the purposes of costing & integration into the simulation tool (e.g. PPA, RCC etc). This task will be taken up by HR.

## 2.4 Hypothesis

These are the user selectable hypothesis such as :

- Percentage of LDs renewed
- Departure scenario (e.g. age + number of years in Pension Fund) per professional class
- Replacement hypothesis by prof category
- Rehiring hypothesis by prof category

## 2.5 Simulation Engine

This is the heart of the monitoring tool. Current division tools tend to use Excel Pivot-Tables which are sufficient for what-if scenarios monitoring staff-complements and ratios, but which are incapable of accurately taking into account the cost-impact associated with various career development, departures & arrival scenarios.

Simulations in general may be classified broadly according to figure 2.2 below.

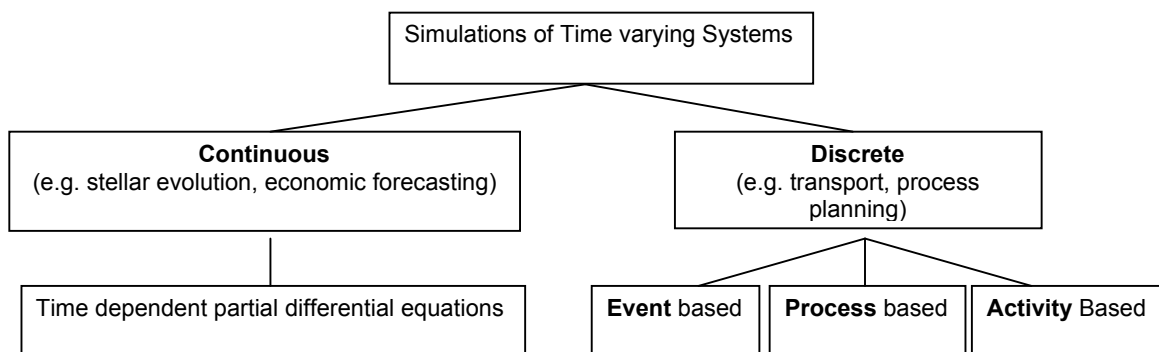


Figure 2.2 Simulation Classification Schema

<sup>4</sup> Original working group talked about default grade+step for vacancies being a3 for all bands except E for which it is a6. This could be made a parameter which is adjustable for the simulation

Many of the particle physics challenges being solved today at CERN fall into the category of Continuous simulations. The simulation of 'people' advancing through their 'career' at CERN falls into the category of DES or Discrete Event Based simulations.

In general one wants to 'model' the advancement of people through the salary grid, subjecting them to 'events' such as arrivals, departures, normal advancements, change of band etc in order to accurately reflect the impact on the budget.

Event Based DES are very well suited to the Object Oriented Programming Paradigm. AS-IDS already has proven expertise in the OO language Java and Java is widely recognised to have a higher developer productivity (by up to 40%) than other programming languages. We therefore proposed to allocate 4 weeks of effort to the development of a Java DES which can be parameterized to model the CERN career advancement.

The simulation of 10 years data for CERN should run in under 5 minutes.

## 2.6 Simulation Results

The results of the simulation based upon the input data, hypothesis, known contractual data and refined non-contractual data will be written to a database. Typically there will be 300,000 rows of intermediate data (one row per person per month) for 25,000 rows of result set data (one row per person per year)

This database will exist for specialized direct interrogation by FI & HR experts via SQLplus. It will also provide the source for divisional reports produced by this tool interactively on the web

## 2.7 Divisional & Sectorial Reports

These will be HRT-style reports available through a web user interface interrogating the simulation results in order to produce a variety of results in either HTML or Excel format.

The focus of divisional and sectorial reports will be extrapolation of existing data, merging of likely or supposed facts combined with basic hypothesis concerning contract renewal, departures etc. This will form a **planning** mode by which the divisions & sectors may adjust the input parameters in order to simulate the best match for their needs within the given budget and guidelines.

Version 1 aims to provide a variety of reports options through 'pivot' controls. In addition custom ad-hoc reports such as usage will be provided. For any reporting needs not covered directly by the standard reporting functionality of version 1, the data may be exported into Excel for further manipulation.

Simulation: Accelerators 2003-2007 Contract Type: All

Organic Unit:  ?

Between (Year): 2003 and 2007

Only the start year will be considered if you choose to group by Month using the pivot controls below.

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Select columns and pivot table layout below:

Column 1: ■ Year

Column 2: ■ Organic Unit

Column 3: ■ Division

- None
- Organic Unit
- Division
- Group
- PPA Unit
- Cost Centre
- Recharging Cost Centre
- Contract Type
- Path
- Band
- Position
- Category
- Year
- Month
- Full Name


Layout: 

Figure 2.3 Simulation Report Pivot Control

## 2.8 FI , HR & DSU Reports

FI reports will usually be CERN wide simulations with all factors enabled (e.g. unanticipated departures, deaths etc) to provide a **control** mode for budget calculations and for ensuring proposals fall within the P+M budget, the guidelines and medium term plan. Since limited reporting functionality will be provided in version 1, direct database access to the result set for specialized FI, HR & Strategic Planning (DSU) users will be given.

### 3 User Perspective

The user of the tool will have access to the following functions :

1. Simulation Manager
2. Simulation Editor
  - a. Modification of Global Constants (HR, FI, DSU only)
  - b. Modification of Simulation Parameters
  - c. Modification of Hypothesis
  - d. Data Refinement
3. Simulation Reports
4. Simulation Database (FI, HR, DSU only)

These functions are described in detail in the following paragraphs

#### 3.1 Simulation Manager

The simulation manager allows users to define, create, clone, modify and delete 'simulations'. Once a simulation has been setup then it may be run, reported-on or refreshed with updated information. All managed simulations are stored in the database.

[Create a new simulation](#)

Click on a simulation's name to force it to run, and regenerate its data.

| Simulation Name                        | Description | Division | Start Year | End Year | Creation Date |   |
|--|-------------|----------|------------|----------|---------------|---|
| <a href="#">Accelerators 2003-2007</a> |             |          | 2003       | 2007     | 02.05.2003    | <a href="#">Edit</a>   <a href="#">Delete</a> |
| <a href="#">Admin 2003-2007</a>        |             | AS       | 2003       | 2007     | 02.05.2003    | <a href="#">Edit</a>   <a href="#">Delete</a> |
| <a href="#">LHC Construction</a>       |             |          | 2003       | 2007     | 02.05.2003    | <a href="#">Edit</a>   <a href="#">Delete</a> |

Figure 2.4 Simulation Manager

#### 3.2 Simulation Editor

The simulation editor allows users to modify the parameters, hypothesis and data associated with simulations as well as enabling / disabling certain simulation options.

|  |  |
|--|--|
| Simulation Name:                       | <b>Admin 2003-2007</b>                       |
| Description:                           | <input type="text"/>                         |
| Division:                              | AS <input type="text"/>                      |
| The simulation will run between years: | 2003 until <input type="text" value="2007"/> |

You can enable and disable certain aspects of the simulation using the checkboxes below. If an aspect's checkbox is not checked it will not be considered when the simulation runs. You can also edit how much influence each aspect has over the simulation by clicking on its edit link.

|  |  |
|--|--|
| <b>Limited Duration Contracts</b>  |  |
| <input checked="" type="checkbox"/> <a href="#">[edit]</a> LD 6 year extension enabled                   | <input checked="" type="checkbox"/> <a href="#">[edit]</a> LD becoming indefinite enabled              |
| <input checked="" type="checkbox"/> <a href="#">[edit]</a> LD shiftwork becoming indefinite enabled      |  |
| <b>Fixed Term Contracts</b>  |  |
| <input checked="" type="checkbox"/> <a href="#">[edit]</a> FT becoming indefinite enabled                | <input checked="" type="checkbox"/> <a href="#">[edit]</a> Shiftwork replacement factors enabled       |
| <b>Budgetary and Financial</b>   |  |
| <input checked="" type="checkbox"/> <a href="#">[edit]</a> Distribution of unused budget enabled         |  |
| <b>Career</b>  |  |
| <input checked="" type="checkbox"/> <a href="#">[edit]</a> Extra step factors enabled                    | <input checked="" type="checkbox"/> <a href="#">[edit]</a> Band advancement factors enabled            |
| <input checked="" type="checkbox"/> <a href="#">[edit]</a> Path advancement factors enabled              |  |
| <b>Departures and Retirements</b>  |  |
| <input checked="" type="checkbox"/> <a href="#">[edit]</a> General departure replacement factors enabled | <input checked="" type="checkbox"/> <a href="#">[edit]</a> Unexpected departure factors enabled        |
| <input checked="" type="checkbox"/> <a href="#">[edit]</a> Retire at 60 w. 35 years pf factors enabled   | <input checked="" type="checkbox"/> <a href="#">[edit]</a> Retire at 63 w. 35 years pf factors enabled |

Figure 2.5 Simulation Editor

Figure 2.5 shows how from the main screen of the simulation editor one may enable / disable parameters to be used in the simulation. For example in **planning mode**, divisions would usually want to retain full control of departures and would therefore disable the unexpected departure factors in favour of entering any known or suspected departures manually. In contrast, in **control mode** FI division would want to enable the unexpected departure factor (parameterized accordingly on empirical evidence).

Data to be modified in the simulation editor falls into four categories :

### 3.2.1 Modification of Global Constants (HR, FI only)

All Constants and factors used in the simulation are entirely parameterizable and database driven. However, important global constants such as the 'overhead' factor or the 'budgets' may only be modified by authorized people in FI, HR or DSU.

### 3.2.2 Modification of Simulation Parameters

Parameters passed to the simulation such as the percentage of LDs to IC may be modified. Modification to the granularity of the professional class is supported.

|   |          |          |          |          |           |           |           |
|---|----------|----------|----------|----------|-----------|-----------|-----------|
| Simulation Name: <b>Admin 2003-2007</b>                     |          |          |          |          |           |           |           |
| Simulation Parameter: <b>LD becoming indefinite enabled</b> |          |          |          |          |           |           |           |
| Categories:   | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5A</b> | <b>5B</b> | <b>5C</b> |
|   | 0.1      | 0.67     | 0.8      | 0.8      | 0.8       | 0.8       | 0.8       |

Figure 2.6 Modification of Parameters based on Professional Class

Similarly parameters based on career path (e.g. advancement factors) may be modified where appropriate

|   |          |          |          |          |          |          |          |
|---|----------|----------|----------|----------|----------|----------|----------|
| Simulation Name: <b>Admin 2003-2007</b>                       |          |          |          |          |          |          |          |
| Simulation Parameter: <b>Path advancement factors enabled</b> |          |          |          |          |          |          |          |
| Career Path:  | <b>A</b> | <b>B</b> | <b>C</b> | <b>D</b> | <b>E</b> | <b>F</b> | <b>G</b> |
|   | 0.1      | 0.18     | 0.18     | 0.08     | 0.25     | 0.08     | 0.03     |

Figure 2.7 Modification of Parameters based on Career Path

Typically the default values of the CERN and divisional constants for these parameters will be defined by HR division based on empirical evidence.

All of these parameters may also be varied across time e.g. in order to use a different distribution in 2007 as opposed to 2004.

### 3.2.3 Modification of Hypothesis

Hypothesis may be enabled and disabled appropriately (e.g. to select between retiring at 60 with 35 years in pension fund, or retiring at 65 etc).

|  |   |  |   |
|--|---|--|---|
| <b>Limited Duration Contracts</b>                        |   |  |   |
| <input checked="" type="checkbox"/> <a href="#">edit</a> | LD 6 year extension enabled                 | <input checked="" type="checkbox"/> <a href="#">edit</a> | LD becoming indefinite enabled              |
| <input checked="" type="checkbox"/> <a href="#">edit</a> | LD shiftwork becoming indefinite enabled    |  |   |
| <input checked="" type="checkbox"/> <a href="#">edit</a> | Retire at 60 w. 35 years pf factors enabled | <input checked="" type="checkbox"/> <a href="#">edit</a> | Retire at 63 w. 35 years pf factors enabled |

Figure 2.7 Modification of Hypothesis

Furthermore the hypothesis may be switched on / off at a finer level of granularity, e.g. by professional class.

|  |          |          |          |          |           |           |           |
|--|----------|----------|----------|----------|-----------|-----------|-----------|
| Simulation Name: <b>Admin 2003-2007</b>                                  |          |          |          |          |           |           |           |
| Simulation Parameter: <b>Retire at 60 w. 35 years pf factors enabled</b> |          |          |          |          |           |           |           |
| Categories:  | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5A</b> | <b>5B</b> | <b>5C</b> |
|  | 0.0      | 0.0      | 1.0      | 1.0      | 0.0       | 1.0       | 1.0       |

Figure 2.8 Modification of Hypothesis by Professional Class

### 3.2.4 Data Refinement

For known or desired objectives not yet registered in Oracle HR, data may be refined, e.g. to choose a particular person to move from LD to IC, or to register the anticipated departure of a person. This will be done with the event editor for the person as illustrated below.



Figure 2.9 Creation of a simulation 'event' for a person

For the purposes of the simulation, any future event can be registered against a person such as starting a new contract, ending a contract, changing a PPA, Org Unit, Career Path etc. Depending on the 'event' to be registered, the necessary parameters will also be required to be entered for the simulation (e.g. for a new contract the date, type of contract, professional category, PPA, Org Unit etc).

Figure 2.10 Editing a simulated 'event' for a person.

### 3.3 Simulation Reports

The majority of reports available from version 1 of the tool will be produced with the familiar cross-tab report functionality (standard in HRT & CET). For any given simulation, up to 3 dimensions may be selected to be constructed in a matrix format. The dimensions available will be :

Name, Division, Group, Organic Unit (including Sector), PPA, Cost Centre, Recharging Cost Centre, Contract Type, Path, Band, Category, Year, Month, PRP

The output data will shown in :

# Persons, Cost (CHF) and Full Time Equivalents (Workforce)<sup>5</sup>

<sup>5</sup> E.g. 1 Person working at 50% will show as 1 in the Person view, but '0.5' in the workforce view. 'Paid FTE' may be a more accurate representation as in the case of PRP you may have people who have physically left CERN but are on the payroll for another 2 years.

Simulation: Admin 2003-2007  
 Organic Unit: Accelerators 2003-2007  
 Between (Year): LHC Construction

Contract Type: All

Only the start year will be considered if you choose to group by Month using the pivot controls below.

Select columns and pivot table layout below:

Column 1: Contract Type  
 Column 2: Year  
 Column 3: None

Layout: [Pivot icons]

Output Format: HTML No form:  Borders:  [Store Report] [Reset] [Retrieve]

|                         | 2003        |                  | 2004        |                  | 2005        |                  | 2006        |                  | 2007        |                  | Total        |                   |
|-------------------------|-------------|------------------|-------------|------------------|-------------|------------------|-------------|------------------|-------------|------------------|--------------|-------------------|
|                         | FTE         | Cost (CHF)       | FTE         | Cost (CHF)       | FTE         | Cost (CHF)       | FTE         | Cost (CHF)       | FTE         | Cost (CHF)       | FTE          | Cost (CHF)        |
| <b>Indefinite</b>       | 40.7        | 7,253,581        | 35.5        | 6,444,024        | 34.4        | 6,316,524        | 33.5        | 6,165,593        | 31.2        | 5,709,739        | <b>175.4</b> | <b>31,889,460</b> |
| <b>Limited Duration</b> | 9.7         | 1,337,823        | 14.7        | 2,015,401        | 17.3        | 2,387,417        | 16.0        | 2,273,164        | 14.6        | 2,093,573        | <b>72.2</b>  | <b>10,107,377</b> |
| <b>Grand Total</b>      | <b>50.4</b> | <b>8,591,404</b> | <b>50.2</b> | <b>8,459,424</b> | <b>51.8</b> | <b>8,703,941</b> | <b>49.5</b> | <b>8,438,756</b> | <b>45.8</b> | <b>7,803,312</b> | <b>247.7</b> | <b>41,996,837</b> |

Figure 3.1 simulation results by Contract Type

Simulation: Admin 2003-2007  
 Organic Unit:   
 Between (Year): 2003 and 2012

Contract Type: All

Only the start year will be considered if you choose to group by Month using the pivot controls below.

Select columns and pivot table layout below:

Column 1: Category  
 Column 2: Year  
 Column 3: None

Layout: [Pivot icons]

Output Format: HTML No form:  Borders:  [Store Report] [Reset] [Retrieve]

|                    | 2003        |                  | 2004        |                  | 2005        |                  | 2006        |                  | 2007        |                  | Total        |                   |
|--------------------|-------------|------------------|-------------|------------------|-------------|------------------|-------------|------------------|-------------|------------------|--------------|-------------------|
|                    | FTE         | Cost (CHF)       | FTE         | Cost (CHF)       | FTE         | Cost (CHF)       | FTE         | Cost (CHF)       | FTE         | Cost (CHF)       | FTE          | Cost (CHF)        |
| 2                  | 22.6        | 4,063,171        | 23.5        | 4,228,457        | 23.2        | 4,258,868        | 22.0        | 4,146,819        | 19.7        | 3,683,042        | <b>111.0</b> | <b>20,380,357</b> |
| 3                  | 2.8         | 438,788          | 3.0         | 441,681          | 3.0         | 448,964          | 2.8         | 425,259          | 3.0         | 454,305          | <b>14.5</b>  | <b>2,208,997</b>  |
| 5A                 | 13.2        | 2,583,204        | 12.8        | 2,429,101        | 14.0        | 2,562,987        | 13.4        | 2,436,624        | 12.2        | 2,285,140        | <b>65.7</b>  | <b>12,297,056</b> |
| 5B                 | 6.3         | 849,222          | 5.9         | 769,018          | 6.5         | 840,156          | 6.3         | 835,290          | 5.9         | 786,060          | <b>31.0</b>  | <b>4,079,745</b>  |
| 5C                 | 5.5         | 657,019          | 5.0         | 591,168          | 5.0         | 592,966          | 5.0         | 594,765          | 5.0         | 594,765          | <b>25.5</b>  | <b>3,030,683</b>  |
| <b>Grand Total</b> | <b>50.4</b> | <b>8,591,404</b> | <b>50.2</b> | <b>8,459,424</b> | <b>51.8</b> | <b>8,703,941</b> | <b>49.5</b> | <b>8,438,756</b> | <b>45.8</b> | <b>7,803,312</b> | <b>247.7</b> | <b>41,996,837</b> |

Figure 3.2 simulation results by Professional Category

Some standard simulation reports will also be made available in version 1 for planning mode in order to show variations with respect to budget.

### 3.3.1 Zooming In

Since the simulation is a DES simulation then the level of detail exists to the granularity of person by month across the entire simulated period. Therefore behind every number it is possible to zoom-in to the level of the detail of the person(s) to see which people make up the numbers. This is important for being able to 'justify' the results as well as modifying the individual parameters on a person-basis in order to 'adjust' the simulation.

**3.4 Simulation Database (FI, HR, DSU only)**

Direct SQL access will be provided to HR, FI & Strategic Planning (DSU) for extraction of the results of the simulation into their planning tools, e.g. for Personnel Budget Planning or Staff Complements.

## **4. Other Requirements**

### **4.1 Performance Requirements & Considerations**

Existing Divisional Tools are based on Excel Pivot-Tables and hence their response time is immediate<sup>6</sup>. The HR tools require a batch run and the FI tools require a Fortran programme run, but generally the results are available rapidly. For the purposes of this tool we separate the performance requirements into two modes, namely generating results of a new simulation and reporting on those results :

#### **4.1.1 Performance Requirements of generating results of a new Simulation**

Results from a new simulation should be available within 5 minutes of 'launching' the defined simulation.

#### **4.1.1 Performance Requirements of Interactive Reporting on an existing Simulation**

The 'reporting' on an existing simulation should be interactive. Therefore response times should be in the order of maximum 5 seconds for retrieving the global results of a simulation. For detailed results (e.g. by person) the response time should be comparable to existing reporting tools such as HRT & CET.

### **4.2 Security & Confidentiality**

In general as with all AIS tools the data will be transmitted across Secure HTTP and access will be via the AISLogin. As this tool potentially contains additional sensitive data then the following considerations must be taken into account.

#### **4.2.1 Access to the tool**

For version 1 of the tool access will be restricted to DPOs, SPOs, Division Leaders (on request) and authorized FI, HR & DSU personnel working in this area. This will limit the user community to about 20 people.

#### **4.2.2 Access to global parameters**

The global parameters used by the tool such as the 'cost overhead factors' and other default parameters will be maintained by FI, HR & DSU..

#### **4.2.3 Sharing of Data**

Simulations may be shared between users, but only with the express consent of the simulation owner.

#### **4.2.4 Access to Sensitive Information**

Some of the 'Hypothetical Information' may be highly sensitive (e.g. for known non-rehirings) and currently not stored in any database. If entered for the purposes of the simulation it remains non-contractual and access to this information is restricted entirely to the simulation owner. Eventually at a certain point in time the data used for simulation in a division would be proposed as a plan. In that case, access to sensitive info (i.e. simulation assumptions & parameters) has to be given to HR.

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<sup>6</sup> It should be noted that Excel-based tools do not have a DES simulation engine which takes into account advancement costs.

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## 4.3 Business Rules

The simulation tool will not 'enforce' the business rules and guidelines of the HR Plan. The tool is a means for the users to ensure under which circumstances and what precise conditions CERN personnel policies (such as those described in the HR Plan) may be adhered to.

Similarly the tool will not enforce budget control, but will allow the users to see the different budget scenarios for the personnel budget and take decisions accordingly.

### 4.3.1 Costs used in the tool

Costs will be compared using standard costs as defined by the formula below :

$$\text{standard cost} = \text{basic salary} \times \text{overhead factor}$$

The overhead factor is presently provided by FI division.

It is important to be aware that several standard ways of measuring & comparing personnel costs exist :

#### **Real Cost**

This is the real cost of the person to the organization which in addition to the figure on the pay-slip includes claims for school-allowance, home-leave etc.

#### **Average Cost**

This is the average of the 'real costs' over a predefined group of people (e.g. by professional category or grade)

#### **Standard Cost**

This is the basic salary of the person multiplied by an overhead factor which smoothes the particular costs dependent on individuals situations (school fees, non-residence allowance etc) across the entire population<sup>7</sup>

While the following holds true

$$\sum \text{real costs} \_ \sum \text{average costs} \_ \sum \text{standard costs}$$

it is important to note that only the use of 'standard' costs allows decisions to be taken without prejudice in an objective fashion and compared to the given budget.<sup>8</sup>

## 4.4 Operating Environment

The simulation tool will be a servlet web based architecture supporting the major platform/browser combinations supported by other AIS tools such as CET & HRT.

The server will run on a Java Application Server and require an Oracle Database. Due to the simulation nature of the application a high processor speed is required.

Due to the current hardware limitations of our servers, multiple simultaneous users may cause serious performance degradations (see target user audience below).

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<sup>7</sup> Each individual having the same grade & step will have the same standard cost irrespective of home-station, residence allowance, family status etc,

<sup>8</sup> If 'Real Costs' were used then age, family status and nationality would cause discrepancies and potentially result in discrimination in the resulting decision making process.

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## 4.5 Target User Audience

For version 1 of the tool access will be restricted to DPOs, SPOs, Division Leaders (on request) and authorized FI, HR & DSU personnel working in this area. This will limit the user community to about 20 people. It is not recommended to extend this for version 1, and the hardware implications of an extended user community should be reviewed prior to any expansion.

## 4.6 Design and Implementation Constraints

Version 1 of the tool has a development timescale of 3 months and a development effort available of 4.5 person months. Given the tight development schedule functionality in version 1 is focused on core functionality

## 4.7 Assumptions and Dependencies

The tool depends on correct data in the following areas :

**Oracle HR / Foundation** : The up-to-date contractual data of all CERN staff. (HR)

**Vacancies** : Data concerning the costing & charging for future CERN staff (HR)

**Global Parameters** : Unexpected departure factors etc (FI, DSU)

**Overhead Factors** (FI, DSU)

Version 1.0 will rely on heavy cross-checking with FI & HR divisions to assure that the results are coherent and in-line with existing tools.

## 4.8 Boundary Constraints (scoping)

Appendix A details the list of items which will and will not be implemented for version 1.

## 4.9 User Documentation

Limited user documentation will be available with version 1.0

## References

1. *ANSI/IEEE Std 830-1984, Software Requirements Specification*
2. *Outline by HRRB subgroup on the Requirements Specification for a Staff monitoring tool*
3. *CERN/FC/4628 Human Resources Plan 2003-2010*

**Appendix A****What v1 of the tool will do**

The first version of the P+M planning and monitoring tool aims to provide a web-based reporting functionality to help Divisional & Sectorial Planning Officers in the daily decision making process regarding overall HR actions in the context of P+M, as well as providing a longer term view of the Human Resources potential & associated cost estimations.

The first version will therefore :

- Extract known 'contractual' data from OHR
- Extrapolate data according to given hypothesis providing a yearly view up to 10 years in the future.
- Enable the entry, storage & retrieval of 'supplementary' non-contractual information required in order to refine forecasts.
- Merge hypothetical data with supplementary data to provide a refined forecast.
- Provide a control mode, i.e. produce information by extrapolating known data according to some basic hypotheses
- Provide a planning mode, i.e. allow entry & merging of supposed/supplementary data such as rehiring, departures to see impact / variation on plan
- Will focus on divisional requirements. (Today ad-hoc solutions exist in the divisions, but no uniform way of doing analysis across the divisions)
- Will provide basic centralised functionality by aggregating the data CERN wide. Current centralized tools in FI & HR should however be maintained.
- Show personnel ceilings (budgets), if stored, but not implement budget control or conformity checks
- Treat movements as local departures
- Incorporate an advancement model
- Show results in FTEs, Workforce and in CHF
- Differentiate between externally funded staff so long as identified by Recharging Cost Centre
- Provide output in HTML & Excel
- Provide various basic consolidations by professional category, ppa, division etc etc
- Provide 'raw' output which may be manipulated further in Excel manually in order to meet any ad-hoc demands not covered in the above functionality

The above functionality in itself is ambitious for a 3-month delivery schedule

**What v1 of the tool will NOT do**

In order to meet this delivery schedule, the following items must be put outside of the scope for the first version.

The first version will not :

- Incorporate HR plan Guidelines or objective ratios. These can easily be observed, applied manually on the result sets.
- Not replace all the extensive functionality of current FI tool. The FI tool should be maintained for costing, defining budget ceilings & calculating the overhead factor as well as cost cross-checking of this initial P+M tool
- Not replace all functionality of current HR tool. The HR tool should be maintained for ad-hoc queries not covered in the scope of 1<sup>st</sup> version and for cross-check of accuracy & reliability of 1<sup>st</sup> version.
- Automatically ensure conformity to budget
- Not incorporate concept of Local Staff
- Not ensure /warn of all invalid proposals, although some basic operations will not be permitted (e.g. passing Oracle HR end date for IC)
- Cover all movement variations (e.g. with / without budget)
- Provide special treatment for special populations (AC22, Sabbatical, Unpaid Leave). These must be done manually.
- Provide ad-hoc reports covering FI & HR centralized needs, other than those derivable from raw-data.
- Differentiate between contractual & presence end-date (payroll vs at work)
- Treat exceptional contracts (sect 6 of Requirements Doc [2])
- Incorporate Impact of Saved Leave
- Provide for Input parameter sharing
- Provide special Treatment for Detachments
- Have an import/export tool other than standard saving to excel & tab-delimited formats
- Produce pivots beyond 3 dimensions

In the short term the above functionality must be done manually or via existing systems. It is excluded from version 1 and may be scheduled for future releases.



**Appendix B : Project Plan**

