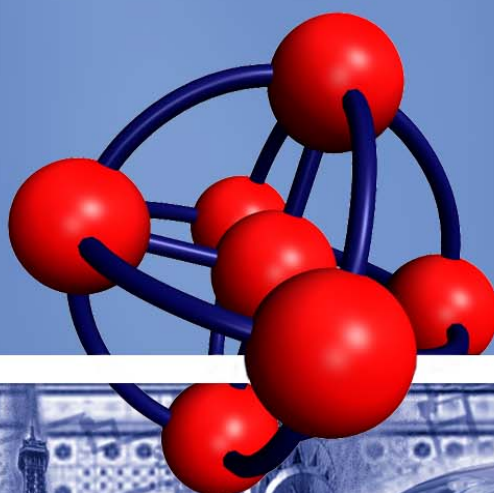


# IBSEN



## Product documentation

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# 1. Introduction

## Insurances: working in a constantly changing environment

The international insurance market is an always changing market. Growing competition between the insurers, the merging of insurance companies, the progressing unification of Europe, the changing European legislation and issuing and outsourcing of IT and/or investments are important trends in this market. New and complex laws result in heavy requirements concerning communication and the obligations from insurance companies towards their clients.

In addition, one can detect an evolution in the consumer behaviour. The increasing assertiveness of the consumer incites the insurers to offer more flexibility and individual options. On one hand, there is a growing consumer demand for investment products, on the other hand; there is an increasing participation of employees in their pension schemes or other settlements. This results in a growing demand to elaborate pension plans on a defined contribution basis rather than on a defined benefit basis. Modern insurance products and pension plans are inline with these changes, resulting in growing requirements for the administration system.

## ICT: Straight Through Processing, outsourcing and SAAS

ICT is also developing strongly. The emphasis is on Chain Architecture. Also we see a growing trend towards outsourcing. Another trend is Straight Through Processing (STP): Employers, employees and insured persons want to interact with the insurance company using the Internet. STP assures transactions are finished without interruptions. A new trend is SAAS: Software as a Service. SaaS offers the possibility to use a software application through the internet. Clients are not buying a software licence but are paying for the actual use.

Employer | Employee data

<p>Go to: <a href="#">Last</a></p> <p><b>Selection employee:</b> <a href="#">New employee</a> <a href="#">Close window</a></p> <p><b>Information:</b> <a href="#">Invoices</a> <a href="#">Mutation overview</a> <a href="#">Employee data</a></p> <p><b>Common information:</b> <a href="#">What to do</a> <a href="#">Frequently asked questions</a></p>	<div style="background-color: #e0e0ff; padding: 2px; border-bottom: 1px solid black;"><b>Employees</b></div> <p><a href="#">Change salary/part-time percentage</a></p> <p><a href="#">Back to employees</a></p> <div style="background-color: #4b0082; color: white; padding: 2px; border-bottom: 1px solid black;"><b>Salary/ part-time change:</b></div> <table border="0" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;">Date of receive:</td> <td style="width: 10%;"></td> <td style="width: 10%;"><input type="text"/></td> <td style="width: 10%;"><input type="text"/></td> <td style="width: 10%;"><input type="text"/></td> <td style="width: 10%;"><input type="text"/></td> <td style="font-size: small;">(dd/mm/yyyy)</td> </tr> <tr> <td>Source:</td> <td></td> <td colspan="4"><input type="text"/></td> <td></td> </tr> <tr> <td>Medium:</td> <td></td> <td colspan="4"><input type="text"/></td> <td></td> </tr> <tr> <td>Mutation date:</td> <td></td> <td><input type="text"/></td> <td><input type="text"/></td> <td><input type="text"/></td> <td><input type="text"/></td> <td style="font-size: small;">(dd/mm/yyyy)</td> </tr> <tr> <td>Part-time percentage:</td> <td>100%</td> <td colspan="5"></td> </tr> <tr> <td>Salary (monthly):</td> <td>€ 3.200,00</td> <td colspan="5"></td> </tr> <tr> <td>Supplement (yearly basis):</td> <td>€ 200,00</td> <td colspan="5"></td> </tr> <tr> <td>Bonus:</td> <td>€ 1.500,00</td> <td colspan="5"></td> </tr> </table> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <span>Cancel</span> <span>Send</span> </div>	Date of receive:		<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	(dd/mm/yyyy)	Source:		<input type="text"/>					Medium:		<input type="text"/>					Mutation date:		<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	(dd/mm/yyyy)	Part-time percentage:	100%						Salary (monthly):	€ 3.200,00						Supplement (yearly basis):	€ 200,00						Bonus:	€ 1.500,00					
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Example of an internet page

All these development in business as well as ICT challenge insurance companies a lot. An insurance organisation has to be very well organised so optimal support can be delivered to the constantly changing environment. To achieve this, insurance companies have to try to distinguish themselves by an innovative product policy, a good marketing department, and an excellent execution of the administration.

Today's insurance companies challenges are:

- Be able to adapt products and processes quickly, due to fiscal and legal changes
- Offer an optimal support in communication with clients: transparency
- Offering effective and concurrent products: reducing costs
- Finding a balance between costs for and the graduation of automation
- Be able to implement administration systems which are not the stumbling-blocks, but which create opportunities

The insurance company has different options in advising and using ICT. Administration systems have to be developed with a strong base for the constantly changing environment: flexibility is a requirement. This results directly in requirements for the underlying model of the system.

## 1.1. *What is IBSEN?*

IBSEN means Insurance Business Engines. Based on the concept of IBSEN, Practis has developed an administration system for the life and pensions market. The knowledge of the insurance market, the specific knowledge of ICT and the years of experience resulted in a powerful and flexible system. IBSEN provides in the management insurance products on an individual and semi group basis for the private insurance market as well as the administration of group insurances for the professional market.

<i>Needs insurance companies</i>	<i>Advantages IBSEN</i>
Flexibility	-Different types of product -Configuration and use of centralized rules and data - Configuration of products based on rules calculation rules and product elements -Configuration of processes
Chain integration	-Access for employers, employees, insured persons through the internet -Exchanging information with other systems using XML messages, Enterprise Service Bus (ESB) or other interfaces -Uninterrupted transaction of mutations (STP)
Reduction of costs	-Reusing calculation rules, product elements and processes to quickly implement new or changed products
Time to market	-Advanced degree of automation in the transaction of mutations -Recycling product elements and products using Basic and Commercial Products -Possibility to restrict choices: the concept of using 'ranges'
Improved management of administration systems	-Central and single definition of rules and data; the same functionality is used in different places

- Components are for the most part independent
- One uniform calculation kernel for all calculations

## 1.2. *How to apply the IBSEN concept?*

The IBSEN concept can be applied in different manners. By its architecture, IBSEN offers the possibility to use one or several components (like the Actuarial Knowledge system) in other administration systems or business applications.

## 1.3. *For whom is IBSEN intended?*

(Potential) Users of the administration system IBSEN are:

- Financial institutions
- Life and Income insurance organisations
- Pension funds
- Administration offices

IBSEN is used in Western-Europe, but application outside this area is also possible. Also components of IBSEN can be used within other applications. Potential users are:

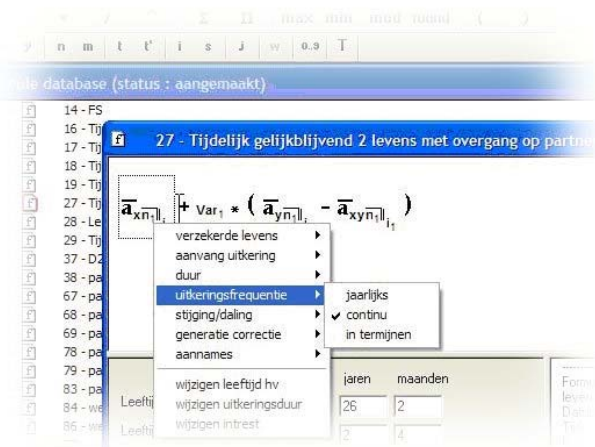
- Actuaries
- Administration offices

## 2. Concepts & Characteristics of IBSEN

IBSEN is a solution for insurance companies' administration which closely fits to the experiences of the users. The system has been developed based on the IBSEN (Insurance Business Engines) concept and architecture of components. Each component supports a specific task of the insurer, from product design to policy management.

Fundamental concepts of IBSEN are:

- *Single Point of Definition (SPOD)*: single and central definition of rules and data which can be approached and executed by different components. For example fiscal rules, commission systems and profit sharing, actuarial rules and calculation rules.
- *Power to the Expert*: IBSEN gives business experts tools by which they can define data and rules in the system fast and efficiently and in a way appropriate for the domain of expertise. Actuarial or insurance technical experts, marketing experts or administration experts influence the operational information system directly.



Example of SPOD: AKS; configuration of formulas

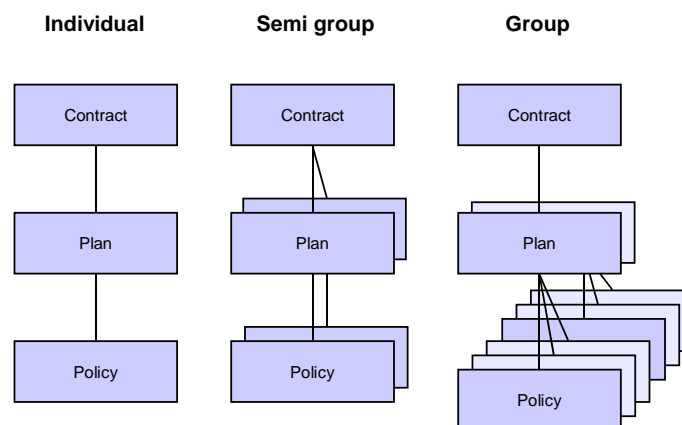
SPOD promotes the maintenance and the correctness of the system. Power to the Expert improves communication between ICT and business.

General characteristics of IBSEN are:

Multi lingual	For each insurance company there is a simultaneous support in max. 4 languages.
Multi company	One can distinguish the details, which have to be managed for each company. Further organisational elaboration is always client specific and is realised according to the requirements of the insurance company.
Multi channel	IBSEN supports the management of distribution channels, remuneration structures and commission administration.
Multi valuta	<p>IBSEN allows to determine the following types of currencies:</p> <ul style="list-style-type: none"> <li>• Company currency</li> <li>• Collection currency</li> <li>• Contract currency</li> <li>• Benefit currency</li> <li>• Fund currency</li> </ul> <p>Pricing of a fund takes place in the currency of the fund, which is determined by the underlying assets.</p>
Multi national	Within the IBSEN applications the country specific aspects, e.g. fiscal aspects, are separated in components, which will have to be organised and defined per country. For international operating organisations this offers the possibility to set up the system per market area.

## 2.1. *Collectivity types*

IBSEN supports the administration of individual, semi group and group insurance contracts. Therefore one distinguishes generic elements as contract, plan and policy, based on the IBSEN concept. The structures designed for contract, plan and policy describe an integrated model that supports the different collectivity types. This is presented in the following figure. Further information can be found in paragraph 3.3.3.



Collectivity types

## 2.2. *Product types*

The product scope of IBSEN is represented in the following scheme.

Group		
Individual	Obligations	
Premium	fixed	variable
fixed	<b>TRADITIONAL</b>	<b>UNIT LINKED</b>
variable	<b>UNIVERSAL LIFE</b>	<b>WHOLE LIFE</b>

### Product types

These product types have following characteristics in IBSEN:

#### Traditional

- Benefit obligation determined in advance.
- Premium (period, height and frequency) determined in advance.
- Profit sharing depending on the company results.

#### Unit Linked

- Benefit obligation not determined in advance and depends on the investment choice and is directly proportional with the chosen investment risk.
- Premium (period, height and frequency) determined in advance.

#### Universal Life

- Benefit obligation determined in advance, depending on the payments made.
- Premium (period, height and frequency) not determined in advance.
- Profit sharing depends on company results.

#### Whole (Universal) Life

- Benefit obligation depends on the payments made and the investment results.
- Premium (period, height and frequency) not determined in advance.

The insurance products, supported in IBSEN, can be divided to the following properties:

<i>Property</i>	<i>Explanation</i>
Fixed premium	Within a fixed premium product, due dates and expected premiums are determined in advance.
Variable premium	Variable premium products have planned due dates, which are purely indicative.
Fixed benefit obligation	Not taking profit sharing into account, a fixed obligation is predictable. The investment risk is therefore with the insurance company.
Variable benefit obligation	A variable obligation has a direct relation with the investment results of the underlying values. The investment risk is in this case with the policyholder.

## **2.3. Mutation processes**

IBSEN supports transaction handling automatically where appropriate and has a generic principle for transaction handling. This assures that the handling of transactions is standardized and results are imitative.

The handling of transactions is the same for each administration; the administration of contracts, policy administration, provision administration, billing administration and claims handling. Mutations can be offered to IBSEN using xml messages or using IBSEN screens (IBSEN Client).

### *Support of transactions*

Following transactions are being support using IBSEN:

- Administration of new products
- Changing existing products
- Ending products
- Administration of new framework agreements
- Changing existing framework agreements
- Prolongation of framework agreements
- Ending mantel contracts
- Administration of new (individual) contracts
- Changing existing (individual) contracts
- Prolongation of (individual) contracts
- Ending (individual) contracts
- Administration of new policies
- Salary/ part-time changes
- Job leaving
- Premium Holiday
- Marriage
- Cohabitation
- Birth child

- Death of affiliate
- Death of partner
- Death of child
- Switch
- Changing premium
- Investment premium
- Reserve transfer
- Renewal of premium
- Renewal of risk premium/costs
- (Early) Expiration
- Transaction of premium free policies

New mutations are, if all basic elements and calculations are available, with limited effort easy to implement (although it also depends on the requirements and complexity of processes and legal issues).

#### *Mutation history*

Transacted mutations are fully historical, regarding source, input and results.

#### *Future mutations*

IBSEN supports future mutations. Messages, which have to be processed later on, can be delivered to IBSEN. These messages receive the state 'postponed'. A batch program will transact these messages when appropriate.

#### *Retroactive effect*

Regarding the retroactive effect of handling transactions, IBSEN supports two types. If a policy is processed with a date in the past, IBSEN is also transacting the 'missed' mutations like renewal of risk premiums and costs, adding interest and bonus units, ending orphan's pensions, transaction of increasing premiums (caused by age or duration). The second type supported, is the standard retroactive effect. IBSEN supports this automatically. If a mutation is being transacted using a transaction date before a processed mutation, IBSEN automatically cancels the processed mutation(s) and add them afterwards again.

#### *Corrections*

Within IBSEN corrections can be made on different levels and with different approaches. Some of the standard correction transactions are:

- Correction of interest and unit prices
- Correction of products
- Corrections of contracts
- Corrections of policies due to corrected interest or unit prices
- Corrections of policies due to a correction of the contract
- Corrections by removing mutations
- Corrections by using regular mutations

- Corrections by cancelling mutations
- Corrections by cancelling the whole policy

Corrections can be brought in using standard mutation functionality of IBS EN Client.

#### *Batch transactions*

IBSEN supports several batch transactions:

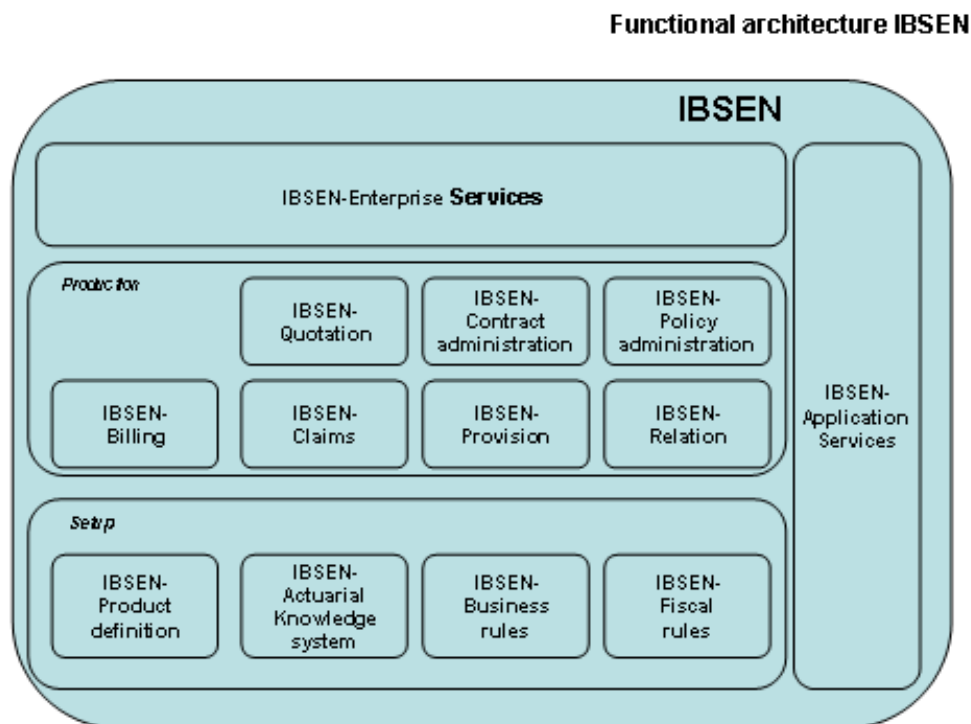
- Renewal of risk premium and costs
- Renewal of (investment) premiums
- Handling end of waiting scheme
- Handling postponed mutations
- Handling end of orphan's pension
- Handling signal lists
- Handling increasing premiums (due to ladders)

The IBS EN batches will be linked to existing tools within the insurance company for scheduling, like Tivoli Workload Scheduling.

### 3. *IBSEN functional architecture of components*

Each IBSEN component supports a part of the insurers activities - varying from designing products to the administration of policies - and reflects the thinking and acting of the business experts. The components are each optimally adaptable constructed for use in the broader environment. This creates an information system which has a right to exist, even in a non predictable future.

Below you find a model of IBSEN:



**Functional decomposition of IBSEN**

#### 3.1. *Short description of components*

Below you can find a brief description of the various components concerning functionality and responsibilities:

##### **IBSEN Product definition**

Supports – combined with IBSEN Actuarial knowledge system and IBSEN Rules definition- the creation, parameterization and management of specifications, which describe an insurance product.

##### **IBSEN Actuarial knowledge system**

Supports the definition and calculation of all actuarial formulas.

**IBSEN Business rules**

Supports the definition and calculation of non actuarial formulas, for instance for the amount of a benefit.

**IBSEN Fiscal rules**

Supports the knowledge of fiscal rules and checks.

**IBSEN Quotation**

Supports the calculation and handling of quotations.

**IBSEN Contract administration**

Supports the drafting and management of insurance contracts and schemes.

**IBSEN Policy administration**

Supports the management of (insurance) policies including the knowledge and logic to handle all policy transactions and interfacing with other systems (f.e. Financial reporting, Output).

**IBSEN Relation**

Supports the management of data concerning all relations of the insurance organisation like personal or legal entities or contacts.

For example: name, addresses, date of birth, telephone numbers, relationships between relations.

**IBSEN Billing**

Supports – within the billing procedure – the creation of insurance technical receivables (due date notices and requests for payment) and bookings, and the interfacing with collection and accounting systems.

**IBSEN Claims**

Supports – within the claims administration – the determination and registration of insurance technical disbursements, which have to be paid per beneficiary as well as the renewal of allowances, domiciling and bookings resulting from this action and interfacing with accounting systems.

**IBSEN Provision**

Supports the definition and management of the distribution organisation (distribution channels, commission systems), the management of the distribution agreements and the administration of commissions and interfacing with other systems (accounting, staff administration).

**IBSEN Enterprise services**

Supports integration of IBS EN with other external systems within a SOA environment.

**IBSEN Application services**

Supports generic basic functionality for other IBS EN components like routines for security, authentication and XML helper modules.

### 3.2. *Global practice and use of IBSEN*

Software and set up both determine the functioning of the IBSEN components. The set up consists of knowledge tables and business rules, which can be defined or composed by using components in the Central Business Office (e.g. AKS and RDC). Combined, both program and set up basically create an infinite functionality.

The character of the components differs. Differences are situated in:

- scope: to what extent is a component generic for the whole business, or specific for a country, company, etc.;

Example	AKS (Actuarial Knowledge System) is considered generic for the insurance business. In the IBSEN architecture AKS is a standard component. CPA (Contract & Policy Application) on the other hand is a non standard component. Due to the requirements related to the different insurance products and processes, the components in the 'Administration Office' require a framework approach. Practis designs and develops the basic (universal) software. A tailor made solution can be created efficiently by setting up the client specific products and processes.
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- user aspects: who are the users of the component (e.g. business expert, contract manager, commercial manager, intermediary, client);
- functional aspects: which business process the component gives support to;
- technical aspects: degree of necessary transferability and (partial) reuse.

### 3.3. *Product management*

An insurance product is defined as a compilation of services, which is offered to the market to cover an insurance need. IBSEN offers the functionality to define the product elements, to assemble products from these elements and to specify the possible product characteristics.

The product specification is the base of (the drafting of ) the contracts and policies in the contract & policy administration, in which contract and plan details can be tailored to specific client needs within the defined possibilities. This results in optimal flexibility.

In defining business rules the following components are used:

- IBSEN Actuarial Knowledge System: definition and calculation of actuarial rules
- IBSEN Rules definition: definition and calculating of non actuarial formulas
- IBSEN Fiscal rules: definition and calculation of fiscal rules and tests

Product elements are defined within (domain) tables. Examples of elements are: types of insurance, assumptions, tariffs, costs, funds, communication methods, clauses, type of premium payers, payment method, currency, type of franchises, covers, benefits.

The rules and product elements are defined in a central place. Definitions can be used to configure the products (using a standard mutation).

IBSEN offers a concept of Basic products (non labelled products for a product group) and Commercial products (labelled products). To support this concept, a generic range & funnelling principle is used to restrict choices for the next level (from Basic to Commercial, from Commercial to Contract,...). The structure of Basic and Commercial products as well as the degree of setup together assure the flexibility for product definition (within the existing framework). Generally, the architecture of IBSEN guarantees that legal issues will be implemented quickly .

### **3.3.1.      *Insurance elements***

Risks are covered by one or more so called 'promises' and 'covers'. In IBSEN five different types of risks are distinguished:

- life
- death
- disability
- pure savings
- medical expenses.

Examples of promises:

- Old age pension
- capital at death
- Minimum capital at death
- Restitution of saving balances
- exemption of premium at disability
- Orphan's pensions

Examples of covers:

- capital at death
- capital at life
- Temporary orphan's pension
- Waiver of risk premium
- Waiver of costs
- Waiver of investment premium

### **3.3.2.      *Investment elements***

In IBSEN Life a distinction has been made between assets funds and liabilities funds.

#### **Assets funds**

An assets fund is a fund managed by the Investments Administration.

### **Liabilities funds**

A liabilities fund is a fund in which the value of a policy is expressed in an administrative way. The liabilities fund is the basis of the policy administration and the reporting towards the clients. The value of the saving balance of a policy, which is linked to a liabilities fund, is expressed in units of the liabilities fund and registered on a personal account.

#### **3.3.3. Management elements**

Loading structures/tariff bases can be distinguished as follows:

- loadings related to insurance aspects, included in the tariff: acquisition, administration and collection surcharge;
- loadings related to investment aspects, like management costs related to the management of a fund;
- loadings related to transaction processes like switch costs;
- loadings related to communication like costs related to the creation of a statement of account.

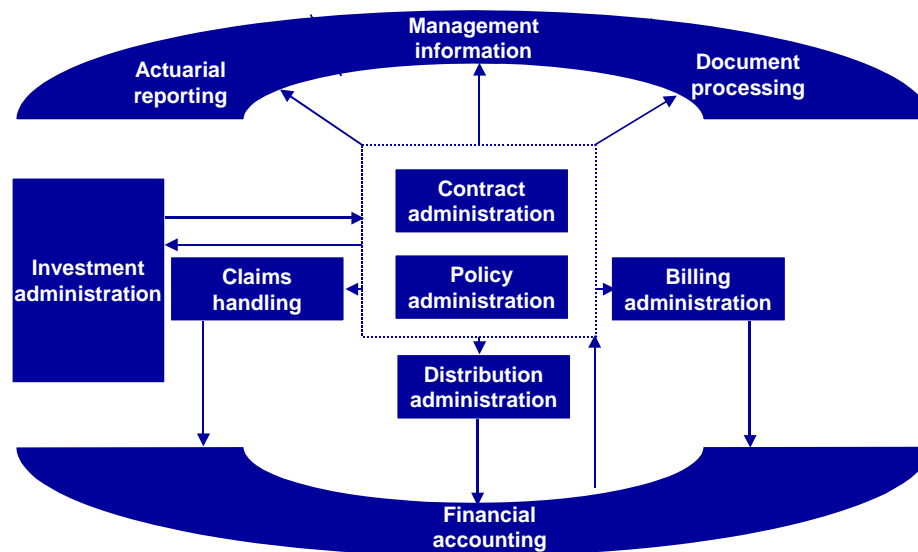
## **3.4. Contract and policy administration**

### **3.4.1. Context**

Insurance agreements, which are concluded between insurer and policyholder, and the obligations resulting from these agreements, are administered in the 'Contract & Policy administration.

Due to the central character of the contract and policy administration (both from a business and an information point of view) this administration is the core of the insurance companies administration. In the administration model, the contract and policy administration is the source for a score of other administrations and information handling systems.

The schedule below represents the central place of the contract and policy administration.



**Contract and policy administration and interfaces**

The following interfaces between the contract and policy administration and other IBSen administration components and sub administrations are recognised:

- deposit reports from the collection/financial administration
- gross allowances to claims handling;
- registered premiums to billing administration;
- production messages to intermediaries and commission administration;
- buy/sell reports to investment management;
- fund prices from investment management;
- states and reserve transactions to the actuarial reporting and management information;
- basic details to document management.

In general, there are high demands towards the integration of the different administrations. Therefore a general interface concept for the integration of the IBSen applications and components has been developed.

### **3.4.2. Company structure**

The company structure is the part of the administration in which the groups and affiliates are managed. A group is a classification within a collectivity (the client). A subgroup is a classification of affiliates within a group. Subgroups can be defined based on various criterions which can be defined by the user himself. The purpose of this is to create a basis for contract agreements or for agreements related to communication.

An affiliate is an individual, which is defined in the central relation administration and is linked to a group. In addition, one determines for each relevant subgroup criterion to which subgroup the affiliate belongs.

The affiliation is often the result of employment at the client in question. In that case the employment details which are relevant for the administration are also registered.

### 3.4.3. Basic model

In the 'Contract & Policy administration information is split up by Contract, Plan and Policy.

<b>Contract</b>	<p><i>Agreements between policyholder and insurer concerning execution and tariffing of the plans e.g. :</i></p> <ul style="list-style-type: none"> <li>• <i>billing</i></li> <li>• <i>mortality tables</i></li> <li>• <i>intrest</i></li> <li>• <i>loadings</i></li> </ul>
<b>Plan</b>	<p><i>Agreements between employer and participants or individual demands concerning:</i></p> <ul style="list-style-type: none"> <li>• <i>participating conditions</i></li> <li>• <i>determination of benefits (right, period and height)</i></li> <li>• <i>insurance and investment construction</i></li> <li>• <i>employer/participant contribution</i></li> </ul>
<b>Policy</b>	<p><i>Results of the plan towards a participant/individual</i></p> <ul style="list-style-type: none"> <li>• <i>height of benefits</i></li> <li>• <i>insured amounts/saving balance</i></li> <li>• <i>premium obligations and contributions</i></li> <li>• <i>actuarial data</i></li> </ul>

#### Basic model of IBSEN

#### 3.4.3.1. Contract

A contract contains the agreements between policyholder (employer, employee or individual) and the insurer. A contract can be an individual contract or a (semi) group contract. Group contracts can be linked to one or more groups (company structure).

The contract consists of:

- one or more plans
- practical and commercial agreements regarding the execution of these plans (contractual agreements), among others surcharges, costs, discounts, fiscal details, invoicing and collection agreements, commission, profit sharing, co-insurance, reinsurance
- Registration information are details which are not essential for the administration of the contract or the matching policies, but this information is mainly registered to inform the administrator (f.e. 'Date signature contract').
- organisational information, example: 'Contract manager'.
- structure information: This indicates the structure of the contract and underlying plans and policies. Not only the collectivity type but also the possible options on the various levels are indicated.

#### 3.4.3.2. Plan

A plan describes the rights and obligations of the affiliates c.q. the individual in question, as for example the agreements made between the employer and the employees. A plan contains the

specification of the insurance product or pension plan. It can be based on a predefined product and can contain a mix of traditional and investment related covers.

Concerning the determination of the height of the benefits hybrid forms are also possible.

It indicates:

- the type of the plan: 'defined benefit' or 'defined contribution';
- which commitments are made or which risks have to be insured;
- how the height of the commitments/risks is determined (goal/available budget);
- how these commitments/risks are covered by insurances and investment products;
- which funds are available for the financing of the commitments c.q. the risks which have to be insured;
- who should pay the premiums and taxes.

A contract can contain various plans.

### **3.4.3.3. Policy**

The policy represents the application of a plan on an individual (an employee in case of a pension plan). Therefore it can be considered as the relation between an individual and a plan. A plan can be applicable to various affiliates and, vice versa, an affiliate can be related to various plans. In the latter there will be various policies for the same person.

Various parts of the plan reoccur in the structure of a policy. The definition and the parameterizing take place in the plan. The results of the application of these definitions on the individual are registered in the policy. The details of the individual (e.g. date of birth, salary, number of children etc.) form the basis for the calculations.

In a policy various persons can assume a role. Not only the policyholder, but also the partners, children and others can assume the role of co-insured person or beneficiary of an insurance cover.

For both insurance covers as investment funds it can be necessary to register the calculated amounts in separate layers for fiscal or insurance technical reasons.

For example:

- the amounts which are determined in a certain fiscal context (fiscal system) have to remain specific for that context due to a deviant fiscal treatment of the allowances in a further stage.
- when the insurance tariff is modified it can be necessary to register the existing values under the old tariff and the new values under the new tariff.

## **3.4.4. Administration aspects**

### **3.4.4.1. Transaction processing**

Within the administration components of IBSSEN, the concept of transactions is central. The different types of transactions characterise modifications in the state of an administrative object such as

contract, plan and policy. Transaction types can be defined and managed by an administrative expert. In this way the system can be adjusted to specific company requirements.

In general a transaction process can be divided into three phases:

- preparation (input, control/approval);
- processing (calculations, state transitions);
- settlement (creation of interface details for the further administrative treatment and creation of documents).

In regard to the definition of transaction processes, a distinction has been made between these phases. In the preparation and settlement phases, aspects concerning the organisation of the administration are relevant. This influences for example the input of the transaction in the system (manually/automated), the steps which have to be followed in the transaction process (to be approved by the manager or not) and the communication of the results of the transaction process to the persons involved. These organisational aspects are irrelevant in the processing phase. Without regard to the input of for instance a salary change transaction (electronically or manual), the processing is the same for both transactions.

For the transaction processing, IBS EN fulfils following conditions:

- the actions of a user are traceable and can be reproduced in the administration;
- all details, which form the point of departure of a transaction and which are entered or deducted during the handling process, are instantly available;
- transactions can be reversed or cancelled;
- transactions with retroactive effect can be realised, using automatic roll back and roll forward mechanisms.

Transactions are registered in a transaction register. This register contains among others: details concerning the historic time table, transaction type, transaction date, the user that has processed the transaction, the status of the transaction (defined, definitely processed, cancelled) and the administrative state within the system.

#### **3.4.4.2. Administration methods**

An insurance administration based on details related to the present situation or a situation in the past, is called a retrospective administration. An insurance administration based on details in the future is called a prospective administration. The present number of units is f.e. a part of the retrospective administration. The projected retirement pension which is obtained on the pension date is f.e. a part of a prospective administration. The determination of prospective details is based on suppositions about the future. As f.e. that the insured person is alive when the projected pension is assigned. Therefore, each detail can be administered as a retrospective as well as a prospective variable.

In most cases, the administration is hybrid and both prospective as retrospective details are be used. Nevertheless, the administrative process of a retrospective administration differs largely from a prospective administration.

Traditionally, administrations are based on prospective details in which the new situation is determined by fixing the prospective details based on the expected benefits and obligations in the future.

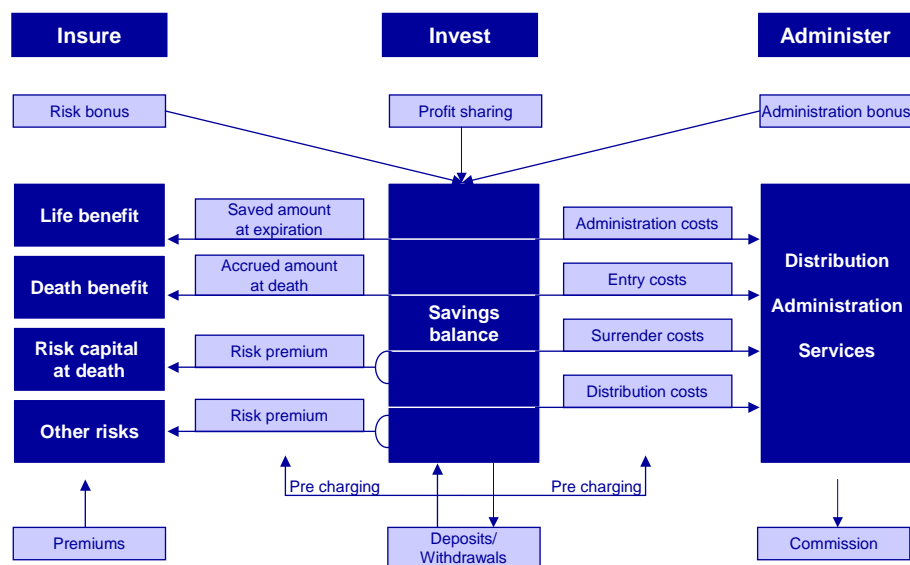
Universal life/unit linked products are administered according to the **recursive method**, a specific variant of the retrospective method. Within the IBSEN Life system traditional insurance products can also be administered using this method.

The recursive method implies that the insurance technical situation as a result of a transaction on moment  $t$  is determined based upon the situation on moment  $t-1$ .

Additional covers for which no premium reserve has been formed, are administered by either, deducting the necessary premium from the amount paid (pre charging) or by deducting the premium of the savings balance (post charging). These premium deductions and reductions are justified separately.

To form the Provision Benefit Obligation (PBO) for traditional and Universal Life insurances premiums are invested in a fund with a fixed yield.

The figure below shows the recursive administration model.



**Figure of the recursive administration model**

### 3.4.4.3. Administration

#### Insure:

Right, period and height of the covers chosen by the affiliate/the individual are administered in this part. The administration is done per cover and if desired per combination of the following general elements for:

- Financing source

Indicates if the saving balance is composed of amounts paid by the employer, the employee or by personal contributions.

- Fiscal system

It can be desirable/necessary to administrate the saving balances separately per fiscal system.

- Fiscal generation.
- Generation of the fiscal system that has to be applied.
- Contractual or profit
- In case of profit sharing it is possible to administer a separate balance starting from the profit.

And the following insurance specific elements:

- Tariff
- The tariff, which forms the basis for the insurance technical aspects.
- Tariff generation
- A generation is composed for each tariff.

Financing of the (additional) insured covers is realised by withdrawing the premium from the savings balance (post charging), or by deducting it from the deposit (pre charging). On the other hand, it is also possible to invoice those premiums periodically. In this case an interface with an invoicing system has to be created.

Within a fixed premium product, due dates and expected premiums are determined in advance. The insurance administration supposes that the premium has been paid on the due date, resulting in a transaction. Non-payment of a premium also causes a transaction: a reduction or conversion, which results in a decrease in the insured allowance of certain or all covers.

Variable premium products have planned due dates, which are purely indicative. Only the effective payment of a premium triggers a transaction for these products. Consequently non-payment of a premium does not trigger any transactions.

#### **Invest:**

In case of insurances with investment risk for the policytaker, the incoming amounts (periodically agreed or free deposits) are justified in personal accounts. For each personal account, there is a separate record for the saving balance and its value development. This administration takes place per combination of the general elements mentioned above and following investment specific elements:

- Fund

Fund in which the saving balance is invested.

- Fund generation

For interest funds, one specifies the interest generation.

On one hand the savings balance is accrued by deposits and profit sharing; on the other hand, costs and premiums are periodically withdrawn for the insured covers. It is also possible for the participants to make withdrawals themselves, regularly or irregularly.

**Administer:**

In general administrative activities such as collection of premiums, management, payments and providing information can be charged additionally. Periodically one can withdraw such costs from the savings balance or charge and justify them as a part of the premium.

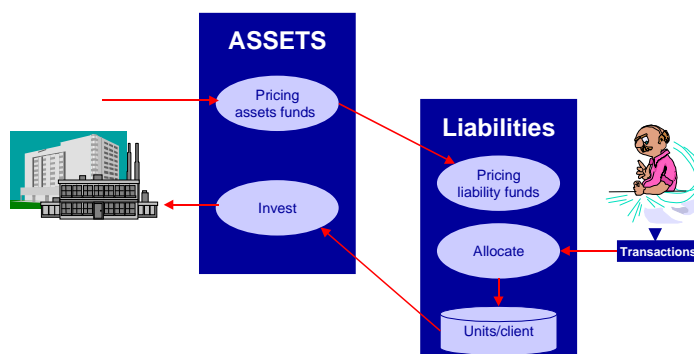
If necessary, one can add a positive result on loadings to the savings balance as a management bonus.

**3.4.4.4. Fund management**

The management of the funds contains various aspects:

- definition of the assets funds.
- definition of the liabilities funds including the ‘fund allocation’. An eventual modification of the ‘fund allocation’ influences the price of an investment unit (liabilities funds) and as a result it also influences the insurance administration.
- determination of the unit prices (unit pricing).
- purchasing and selling of units, based on fluctuations in the allocated units in the insurance administration(s).

From the perspective of the investment administration and the insurance administration these tasks can be classified as follows.



**Fund management**

When a product is composed, defined funds can be selected. At the definition of a plan (settlement/product) for a specific client, the required funds can be selected. If necessary, one can also add supplementary client specific funds at this level.

Within the plan, one also has to define a fund split. This fund split is the default for transactions with an incoming or outgoing cash flow. On the level of transactions, one can choose a deviant fund split. One

can also define that a chosen fund split is only valid for the future or also for the past. In the latter a periodical rebalancing transaction will have to take place.

### 3.5. *Distribution administration*

IBSEN offers the possibility to manage aspects concerning distribution channels.

In this administration one distinguishes:

- the distribution organisation: in this part details are recorded that describe the organisation, the hierarchical structure of the instances which belong to the distribution organisation, the commission systems that are distinguished for the various channels and types of market approaches;
- distribution agreements: specification of the settlement between insurer and distributors.
- the distribution entries: In IBSEN one can administer various distribution parties linked to one contract. For each distribution party a so called distribution entry is created, which contains (links to) the distribution settlements (e.g. distribution channel, commission system, commission percentages,). Based on these settlements the commissions per transaction and commission type are administered.

The following commission types are distinguished:

- collection: the commission which is attributed at each premium paid;
- acquisition: commission which is attributed at conclusion or qualitative increase of the contract;
- bonus: the additional commission which is attributed over the increase of the total contract portfolio of the distributor for a determined period.

### 3.6. *Billing administration*

The billing administration is the administration in which the receivables are determined. A distinction is made between real receivables for traditional insurance products and pseudo receivables for universal life insurance products.

The billing administration receives the relevant details from the contract and policy administration and determines the amount to be paid by the client.

The function of the billing administration can be summarised as:

"to determine, register and communicate to the client the amounts payable by the client related to the distinguished risks of life/death/marriage/birth/disability resulting from the agreements made with the insurer under the terms of an insurance contract"

Characteristic is that per premium payment period the booking data are converted in **cash flow details**. The difference between the booking data and the cash flow details is, next to the periodicity located in

- premium taxes
- invoice surcharges
- size discount
- relation discount

In the billing administration a distinction is made between premiums which expire on a normal due date (periodical premiums) and premiums which can be invoiced on a date other than the normal due date (cash premiums). This distinction can also be found on the invoices (if desired).

The billing administration is based on billing entries, these are elements that form the basis for the communication and registration of the premiums to be paid.

Billing entries are formed per combination of policy, financing source, collectable component, cover and fiscal generation.

### **3.7. *Claim administration***

The function of the claim administration can be described as:

“to determine, register and communicate to the client the amounts payable by the insurer related to the distinguished risks of life/death/marriage/birth/disability resulting from the agreements made with the insurer under the terms of an insurance contract.”

As a result of the transactions in the contract and policy administration, payable amounts are determined either periodically or once only and are put at the disposal of the claim administration by means of an interface. The claim administration takes care of:

- registration of the basic amounts on which the payments are based upon;
- calculation and justification of the deductions (transfer from gross allowances to nett allowances);
- making the allowances (periodically) payable;
- creation of the documents ( in Belgium: invoices and balancing reports)
- creation of interface details to the financial administration;
- creation of the fiscal forms (in Belgium) and reportings concerning allowances.

The claim administration is based on claim entries. A claim entry represents (a part of) a payment order and is formed per combination of policy, beneficiary and autonomous claim component.

## 4. *Technical aspects*

IBSEN can be accessed using its GUI or can be used through a web based front-end. For the web based front-end, screens have to be customized per client.

IBSEN offers the possibility to manage relations with their roles. However, the relation administration is not a CRM application, although it is possible to deliver services to a CRM system. Regarding Financial Management and Accounting IBSEN delivers basic information using interfaces. The administration of Financial Management and Accounting is not included.

In creating Document output IBSEN delivers a few services. The physical creation of the documents is no part of IBSEN. This also applies to imaging and archiving of documents.

Communicating with other systems is (technically spoken) possible in different manners:

- Real-time or using XML messages. IBSEN connects to standard middleware products like Websphere;
- Using ETL Tools

Interfaces are highly generic but can be customized per client.

### 4.1. *Technical Architecture*

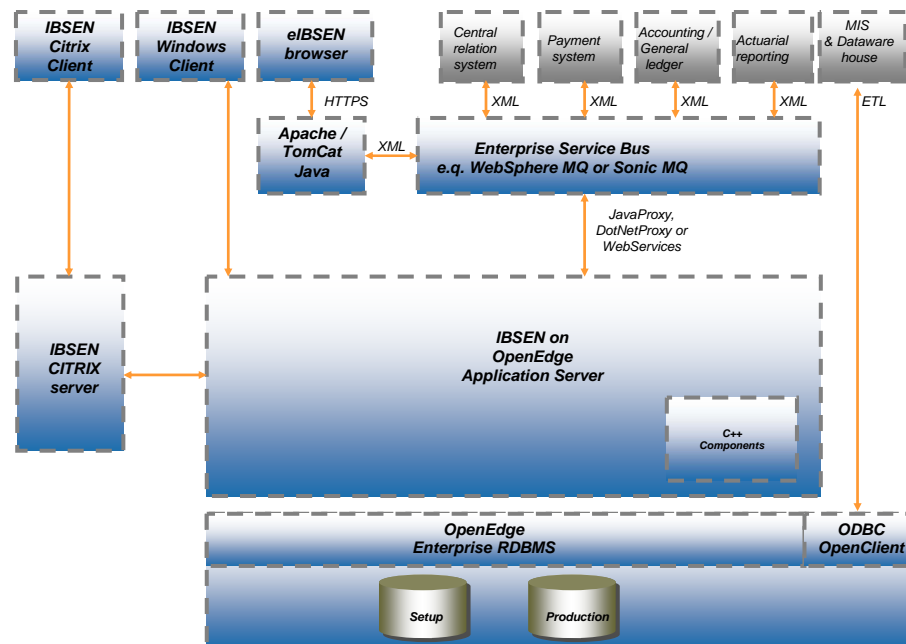
Concerning the Multi Tier architecture the following levels exists:

- Enterprise service level
- Presentation level
- Business logic level
- Data exchange level

IBSEN is developed for a service oriented environment. Communication with portals, GBA-systems, accounting systems, reporting systems takes place using an Enterprise Service Bus (Websphere/Sonic). Connecting to XML services is possible using web services, java and dot net proxy's.

Within the application communication takes place using procedure calls to technical components.

The N-tier architecture raises the scalability and flexibility of IBSEN. Business logic can perform on the client as well as on the server (also hybrid). Other systems can easily connect using the IBSEN services. Technically, the software is divided in components. Using a component manager the components can be started and activated using their interface.



IBSEN Technical architecture

## 4.2. Technology

IBSEN is mainly developed in Progress OpenEdge and C++. C++ has been chosen for reasons of platform independency and high performance. The Progress OpenEdge platform offers options for scalability and developing highly flexible software based on the Progress RDBMS, the Application Server and the Progress Advanced Business Logic within Eclipse.

More information about Progress:

[http://www.progress.com/progress\\_software/products/docs/openedge\\_platform\\_0906.pdf](http://www.progress.com/progress_software/products/docs/openedge_platform_0906.pdf).

## 4.3. Technological infrastructure

The system platforms Windows and Unix are supported. Although the application can perform on a Windows system, it is possible to use the database server and the application server on Unix. Unix systems are chosen for reasons of stability, scalability and performance.

## 4.4. Security

Authentication of users is centrally handled and is carried out in two steps:

- IBSEN is started
- A user or a process is logging on

### Starting IBSSEN

The application has to connect to the databases when starting IBSSEN. Using a decoded file a predefined database-user will connect to the database. This construction is used for starting the client application, the application server and in handling batch processes triggered by external processes. The construction guarantees the distinction between database user and application user.

### A user is logging on

After IBSSEN is started, the user logging on has to be determined with his or her authorization profile:

- User starts IBSSEN: using a userid and password, IBSSEN determines if a user can access IBSSEN and what functionality (See also authorisation)
- An external process is starting a batch in IBSSEN: batch processes can be triggered and monitored by external systems. Per batch a user is defined for reasons of tracking and tracing. This user cannot be used to logon to IBSSEN client. Integration with Tivoli Workload Scheduling (TWS) has been realised.
- A service is called within IBSSEN: another system can make use of IBSSEN services by XML. The user is identified then in the XML message. It is been taken as a starting point that messages from the Enterprise Service Bus cannot be manipulated. For authentication of the user, the authentication service is used when starting a session. The password is decoded following BASE64/DES3. As well at the questioning side as in IBSSEN a key will be administered.

#### 4.4.1. *Authorisation*

IBSEN has a wide authorisation mechanism.:

- Authorisation based on user groups for authorising system parts and menu items. For specific functions can granted access to specific user groups, specific users and can users or groups be excluded.
- A lot of elements (registered in data) have a lifecycle. A lifecycle admits that a record within a table (like a tariff or a cover) is free for use (in production) from a certain date and can be blocked for use from a certain date. Items in production cannot be changed. Items that have been blocked cannot being used for new production.
- Authorisation is possible on the level of data. A distinction can be made between specific contracts within the database. It gives the possibility to divide the relation managers in cells (different teams but the same authorisation profile). One cell cannot change the contracts of another cell.

Mutation processes within IBSSEN are being recorded in a mutation queue. Each mutation is processed by logical steps before the mutation is being transacted definitive within the administration. Only authorised users can follow these steps.

IBSEN also applies the '4 eyes check' (optionally being activated). Data which has been put in by a user has to be validated by another user before transacting.

The transaction mechanism of Progress Open Edge guarantees the transaction of mutations. The scope of the transactions are functionally and technically tested using XML messages and using the

wizard (manual input of data). Also when a lot transactions are being processed in batch, the mutation queue and the transaction mechanism are used. Depending on the error situation, all changes will be

rolled back if the transaction is not finished correctly or the mutation is being rolled back and placed within the mutation queue with a certain state.

Integrity of data is guaranteed by business logic within the components. Also IBSSEN is checking periodically the referential integrity of data en signalizes discrepancies.

## 4.5. *Performance*

There is no explicit limit to the use of IBSSEN. Progress offers possibilities for more than 10.000 concurrent users. The application is scalable using several CPU's. When performance is going down by too many users, CPU's can be added. An important aspect is, that testing has approved the system is not IO-bound but CPU bound.

Performance tests have shown that the size of the portfolio hardly effects the performance of processes. For batch processing, the relation between the number of posts to be processed and the time needed is linear. Batches can be divided for parallel processing over the different CPU's.

## 4.6. *User interface*

IBSEN has a modern (Windows) user interface. This user interface has been developed with the OpenEdge AppBuilder, an advanced tool for developing GUI's.

In transacting mutations, IBSSEN offers the possibility for an expert mode (playground with all the possible options and steps available to the user) or for an user interface based on a predefined wizard. Also a lot of IBSSEN functionality is available using a Java Web interface, which communicates with the IBSSEN business logic using Enterprise Services.

## 4.7. *Connectivity*

The messages that are being exchanged with the Enterprise Services Bus support two types of communication:

- The most part of communication within IBSSEN takes place through synchronous communication. These messages are Request and Reply messages. IBSSEN itself can also make use of this kind of messages (for instance: asking relation information to the CRM system)
- A small part of communication is being transacted asynchronous. The messages are Fire and Forget messages. An example of these kind of messages is a message to the billing administration.

IBSEN also fabricates export files (reports). These files are placed on a file directory or send by email.

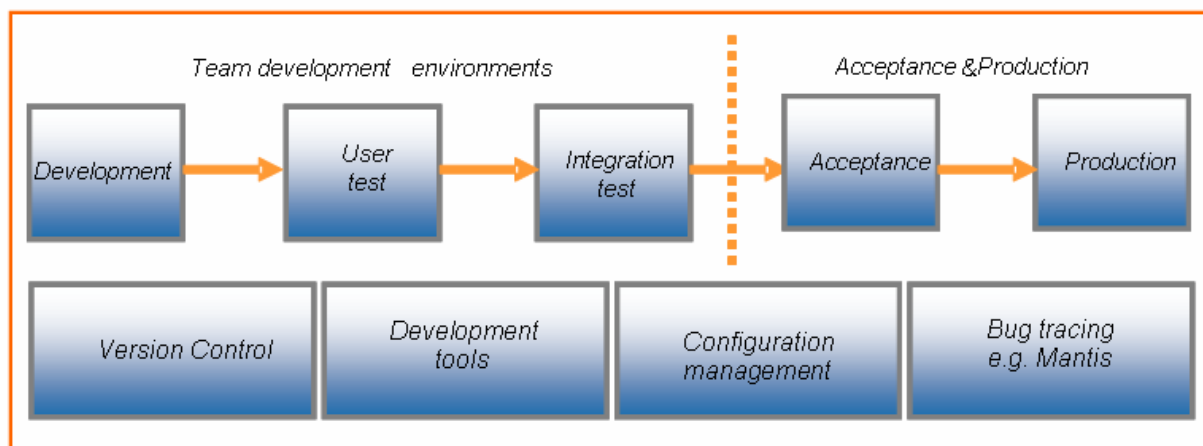
In connecting to Financial Management, several successful connections have been made, f.i. with CODA and FIS2000 (for billing and journalising). For the investment administration IBSEN generates production reports in Excel format. These files can be used within the fund management.

Also ETL (extract transform and load) tooling is used to extract data from IBSEN for use in Actuarial Reporting. The ETL tooling (PowerCenter) makes use of an ODBC connection within IBSEN.

A web application of a client, developed in JAVA, makes use of a lot of services from IBSEN. The same services are being used for transferring and gathering information for the output manager.

## 4.8. *Developing process*

Following procedure is used within the developing process:



### **Development process**

Elements within the developing process are:

- Functional Design (use cases, component specifications)
- Technical design
- (Unit) testing plan
- System documentation
- Data model
- Developing standards/ do's and don'ts
- Software changes
- Code review
- Testing report
- Release notes
- Version Control & configuration management
- Central logging of issues (available for client)

In order to the maintenance and increase of the system, technical documentation is generated in HTML and accessed using intranet. Following information is available:

- Technical data model with key information and indexes
- Overview of functional components and a link to written documentation (word)
- Overview of technical components and their relations
- Documentation of methods and parameters
- CRUD (create/read/update/delete) schemes related to technical components and their methods
- Several indexes for navigation through the documentation

## 5. *Implementation*

Practis provides, in collaboration with partners, various products and services:

- IBSSEN as administration system for life and pensions
- Consultancy regarding the setup of IBSSEN
- Consultancy regarding implementing and integrating IBSSEN, technically as well as organizational
- AKS (Actuarial Knowledge System) as a module which can be used stand alone or can be integrated within other applications
- Consultancy on IT and Business (Life insurances)

### 5.1. *Procedure*

Practis prefers to collaborate with experts of the client organisation in order to guarantee the continuity of the system and the knowledge of the system. Practis then acts as the expert on IBSSEN and the way it is implemented for the client. This means that employees of Practis will be involved in:

- Architectural decision making concerning IBSSEN or the environment of IBSSEN
- Analyzing business requirements
- Finding solutions
- Making functional designs for IBSSEN functionality
- Setup the data within the system
- Making technical designs
- Realization of functionality
- Managing development activities
- Executing (unit) tests and system tests
- Training users

Practis experiences are that for a successful implementation the following is required:

- Commitment from all involved (internal and external) parties: as well on the level of the management as on the execution level
- Sufficient people with mandate from the business
- Great involvement of the business in the test strategy & execution of tests
- A healthy balance between wishes/requirements from the business, the budget and the timing: be realistic
- Just in time training of users
- Explicitness concerning the basic functionality and the time needed (the more basic functionality is being developed, the less time new processes will take)

## 5.2. *Client portfolio*

### **Actuarial Knowledge System (AKS)**

Practis is supplier of IBSEN and the AKS (one of the components from IBSEN) as a package. Practis is maintaining AKS and developing new releases. AKS is among others in use by:

- De Eendragt (Pensioen fund)
- Delta Lloyd Verzekeringsgroep N.V.
- Generali
- ActuComp
- LineData Services
- Swiss Life (Belgium)

### **IBSEN**

The relevant implementations of IBSEN are:

<i>Organisation</i>	<i>Implementation</i>
Swiss Life (Belgium)	IBSEN as Administration system for Individual Universal Life including provision administration and actuarial reporting.
Swiss Life (Belgium)	IBSEN for traditional (semi-) group insurances. Both implementations are based on the same concept and make use of the same central components.
Achmea	Implementation of IBSEN 2.0 as administration system for Group Unit Linked (Life and Pensions). During this implementation IBSEN is accessed using XML-messages with the Enterprise Service Bus. Also IBSEN has been connected to several other systems.

## 5.3. *Business partners*

Practis is not able to deliver all expertise needed, therefore Practis cooperates with several Business Partners. Most of these companies are small to medium size - fitting to the Practis culture - and deliver specific expertise. Practis expects from suppliers quality and commitment regarding Practis, IBSEN and the clients of Practis. In the relationships honesty and openness are crucial.

In selling AKS Practis collaborates with ActuComp.