

# The actuary from academic to professional

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Actuaries are like Frenchmen. They translate everything into their language and then it sounds beautiful, only nobody understands it anymore.

Bühlmann, 1989

## 1 Introduction

Our enemy is complacency, our friend is constructive change.

Anderson, 1989

In 1991 the US Society of Actuaries has developed a Strategic Plan and the UK Institute of Actuaries and the Faculty of Actuaries have issued a joint Strategy for the 1990s. Strategic planning is also essential to the future of Het Actuarieel Genootschap. It will provide leadership continuity of focus. This paper is intended to initiate this process and is structured as a framework for a Strategic Plan for Education and Research. Its outline is as follows:

- 2 Vision Statement
- 3 Fundamentals
  - The Professional Domain of an Actuary
  - The Actuarial Core Model or Paradigm
  - The Mission of Het Actuarieel Genootschap
- 4 A Strategy for Het Actuarieel Genootschap
  - General Objectives

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- Changes Professional Environment
- Strategic Directions for Education and Research
- 5 Implications for Education and Research - Educational and Research Output
  - Role of Het Actuarieel Genootschap
  - Position of the University
- 6 Conclusions
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## 2 Vision statement

Being a professional takes vision and courage.

As experts in financial security systems, the actuarial profession has today unique opportunities to extend its role by performing a wider range of services which address the real needs of employers, institutions and the public.

To remain a viable and vibrant member of the professional community, the actuarial profession must seize these opportunities. In addition, a quantum leap forward from academic to professional is absolutely needed to extend the boundaries of actuarial involvement in the Netherlands.

If the actuarial profession is to proceed a wider path of professional activities, the training needs to be adjusted accordingly and actuarial science, as the body of knowledge of the profession, needs major re-examination.

Given that the actuary has important and unique expertise in the field of financial security systems but is so unimportant in size, it is crucial for the profession to be as unified as possible. The danger of an extension of the boundaries of professional involvement is that more and more actuarial specialty groups will be formed at the expense of cohesion and credibility of the profession.

Re-examining the education system must not lead to too long training for full qualification, otherwise the actuarial profession will face tremendous competition for the brighter students from other professions. Ideally actuaries must qualify before the age of 25. Research has demon-

strated that intellectually, individuals peak at around their middle twenties. Most important discoveries are made in the few years thereafter when students have had sufficient time to assimilate existing theories, but who are still young to have a mind agile enough to conceive new, bold, revolutionary ideas.

National and international developments in most fields of actuarial involvement have led to ever increasing demands on actuaries. This has put the education process and research efforts under considerable pressure and has resulted in the profession being less responsive than ideally it should have been.

A profession that is not always moving forward and extending the boundaries of knowledge will tend to stagnate. This threat is particularly relevant to Het Actuarieel Genootschap. Hence, research efforts of the Dutch actuarial community need to be stepped up substantially. Het Actuarieel Genootschap should take the lead by assuming research direction and co-ordination and identify topics for future research.

Actuaries find it easy to address the structured problems, the scientific ones, the ones that have the right answers. They feel uneasy to address problems that involve creativity, judgement, business acumen and a sense of the 'big picture'.

In the Netherlands, the actuarial department of the University of Amsterdam has many strong points to contribute significantly to the required quantum leap forward in education and research. However, it also has weak points which should urgently and adequately be addressed by the department in order to become a viable and intellectually inspiring institution of the Dutch actuarial community.

### 3 Fundamentals

#### *3.1. Professional domain*

Actuaries are unique as they are the only profession having a deep understanding of financial security systems, their reasons for being, their complexity, their mathematics, and the way they work.

Financial security systems are methods developed to cope with the economic consequences of risk.

In the continually changing field of financial security systems, the role of the actuary is that of:

- designer                      - risk estimator
- adaptor                      - innovator
- problem solver   - technician

### 3.2. Actuarial core model or paradigm

The actuarial core model or paradigm may be defined as the methodology or methodologies generally agreed upon by members of the actuarial community to solve the problems being addressed by that community. As an applied social science, actuarial science is involved with a very diverse group of phenomena. To adequately address the problems it faces, the profession must have a perspective which encompass those phenomena.

The core model to develop the set of tools of an actuary to manage and control the financial process of a financial security system consists of 4 steps and 6 fundamental concepts.

- Step 1:     translating economic reality into a descriptive verbal model
- Step 2:     conversion of the verbal model into a mathematical model fit to simulate management and control
- Step 3:     selection of assumptions with continual experience adjustments
- Step 4:     define requirements for information systems to support management and control of the financial security system

The core model encompass 6 fundamental concepts:

#### a. Random variables

Probability and statistics provide many of the tools on which financial security systems depend.

#### b. Time value of money

Actuaries have a special relationship with the time value of money:

- \* he is especially skilled in the mathematics of finance
- \* financial security systems often have long time horizons

*c. Generalized risk models*

Actuaries have developed generalized mathematical models for the interaction between a financial security system and its members.

*d. Classification, selection and antiselection of risks*

The cluster of ideas surrounding these concepts have two elements:

- (1) statistical: the sorting of risks into homogeneous classifications and the estimation of appropriate probability distributions
- (2) psychological: human beings act on their perception of their own best interest and to select against any system that permits choices and options

*e. Conservatism and prudence*

In the long run actual experience replaces assumptions through the mechanism of experience adjustment, however, the actuary has two reasons to select assumptions conservatively:

- (1) the public interest is better served by a conservative approach
- (2) the consequences of error on the conservative side are preferable to error in the opposite direction

*f. Standards*

These are needed when two fundamental actuarial concepts are in conflict or when a fundamental concept is incongruent with law or strongly held public opinion.

### 3 The mission of het Actuarieel Genootschap

Het Actuarieel Genootschap is an educational, research and professional membership organization of actuaries in the Netherlands whose purposes are:

- to develop the role and enhance the reputation of the actuarial profession
- to promote high standards of competency and conduct among its members
- to advance the state of actuarial science as the body of knowledge of its members

## 4 Developing a strategy

### 4.1 General objectives

To achieve its mission and set priorities for the development of strategies and programs, six general objectives for Het Actuarieel Genootschap are defined:

1. Professionalism
2. Education
3. Research
4. Membership attraction and qualification
5. Organizational support
6. Public influence

### 4.2 Changing professional environment

In a world of rapid change, motivated to extend the range professional skills and specialized expertise, many professions are re-examining their traditional roles and structures. The actuarial profession is experiencing similar pressures.

Many professions are redefining their role by moving to a three-tier structure:

- level 1: fundamental concepts
- level 2: principles employed when fundamental concepts are applied to practical problems
- level 3: standards toward which the overall effort is directed

Traditional users of actuarial services are themselves embroiled in a redefinition of their role in the wider financial services scene.

Development in legislation, both national and EC, with respect to financial security systems have led to ever increasing demands on actuaries. This has put the education system under considerable pressure and has resulted in the profession being less responsive than ideally it should have been. In order to provide relevant contributions to legislative processes, actuaries must be much more than simply good technicians. In this changing environment actuaries have unique opportunities as they possess skills

which lend themselves to involvement in: –the field of investment and economics– the development of solutions for problems involving strategic planning and long-range forecasting which are dependent of contingencies of all kinds, not merely life, death, injury, accident, sickness and so forth.

The actuary's role is no longer exclusive. Many other professionals play an important role in financial security systems. Actuarial expertise must mesh with the capabilities of these other disciplines if financial security systems are to be successful in minimizing the financial consequences of economic risks.

Many of the major financial issues encountered in the management of financial security systems arise on the asset side of the balance sheet. However much of the focus of actuarial training is liability management.

Value based management is rapidly gaining application as the core model to economic management of business and non-profit organizations. It links strategic planning, corporate finance and risk management. As actuaries are trained to operate at the cross section of these disciplines, further advancement of value based management opens up new opportunities both inside and outside traditional boundaries of actuarial activities.

In a world of inexpensive, powerful computers and where previously benefits from financial security systems have been unbundled, the unique abilities of the actuary in his traditional domain have been undermined by inroads from other disciplines.

### *3.1 Strategic directions for education and research*

Broad strategies and activities of Het Actuarieel Genootschap to address general objectives through education and research are:

- Professionalism - *Educate* all members on professional responsibility and ethical conduct
- Start *research* to develop standards of practice and guides to professional conduct
- Provide *educational* support to actuaries who want to expand internationally

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|------------------|--|
| Education        | <ul style="list-style-type: none"> <li>- Recruit students and develop actuaries who combine mathematical <i>skills</i> with business, financial and communication skills</li> <li>- Increase <i>educational</i> emphasis on investment and finance topics</li> <li>- Improve <i>skills</i> needed to operate effectively in a business environment</li> <li>- Deliver continuous <i>education</i> opportunities in:             <ul style="list-style-type: none"> <li>(a) emerging techniques and methods</li> <li>(b) new areas for applications of actuarial science</li> </ul> </li> <li>- Provide actuaries with continuing education programs to assist actuaries to become effective communicators and businesspersons</li> </ul> |
| Research         | <ul style="list-style-type: none"> <li>- Increase commitment of resources to actuarial <i>research</i></li> <li>- Promote fundamental actuarial <i>research</i> at the University of Amsterdam</li> <li>- Expand <i>research</i> to public and business policy issues</li> <li>- Facilitate application of <i>research</i> from other disciplines to actuarial practice</li> </ul>   |
| Public influence | <ul style="list-style-type: none"> <li>- Disseminate <i>research</i> on current financial, economic, and public policy issues</li> <li>- Provide actuaries with <i>skills</i> needed to address current financial, economic, and public policy issues</li> </ul>   |

## 5 Implications for education

### 5.1 Blue print for educational output

To meet future knowledge and skill requirements, the Education Committee of Het Actuarieel Genootschap designed a blue print for subjects and study time allocation. The main features of the proposed curriculum are:

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Basic Mathematics      Study time allocated:	10%
- Calculus	
- Linear algebra	
- Numerical mathematics	
Probability Theory and Statistics	10%
- Statistics	
- Stochastic processes	
Actuarial Mathematics	25%
- Financial mathematics	
- Life	
- Pensions	
- Property and casualty	
Business econometrics	15%
Economics	20%
- Finance and investment	
- Financial accounting	
- Management accounting	
- Strategic planning and marketing	
- Macro economics	
- Micro economics	
- Public finance	
Information Systems	5%
- Computer programming	
- Information systems technology	
Law	5%
- Regulatory compliance	
- Insurance law and regulations	
- Taxation	
- Liability and contract law	
Professional practice	10%
- Professional conducts	
- Professional standards of practice	
- Professional communication	
- Paper on practical issue(s)	
Total	100%

### 5.2 Action program for het Actuarieel Genootschap

There is not much point in having a vision of the future if nothing is done to get there.

The following initiatives and actions are suggested to Het Actuarieel Genootschap to be considered for the near future:

Formation of a Research Committee to report on:

- (1) the future overall structure of research activities initiated, promoted or sponsored by Het Actuarieel Genootschap.
- (2) fundamental research topics to be initiated under the auspices of Het Actuarieel Genootschap.
- (3) a plan to support research at the University of Amsterdam Actuarial Department by identifying sources of fund raising from related businesses, foundations and government agencies and establishing contacts with potential research prospects.

The Education Committee to submit a full report in the Fall of 1992 on the overall structure for the future training of actuaries.

Final decision making by the 1992 Annual General Meeting of Het Actuarieel Genootschap on the incorporation of an Actuarial Institute for Education and Research. Ideally, this Institute should have close links with the Actuarial Department of the University of Amsterdam, provided the Department is able to develop a convincing plan to effectively strengthen its position by removing its weak points.

A mission statement for this Institute could be:

‘The Institute for Actuarial Education and Research is the educational and research organization of Het Actuarieel Genootschap whose purposes are:

- To define and maintain high educational standards for the exercise of the actuarial profession
- To promote research and extension of relevant actuarial knowledge
- To contract high quality services from actuarial education institutions
- To develop and implement a modern and effective system of continuing

post qualification professional education

- To develop and implement suitable admission standards and a modern and effective system of examining actuaries to ensure an appropriate supply of qualified actuaries'

The Institute will be managed by an independent Board of competent actuaries and representatives of users of actuarial services under rules and regulations approved by the General Meeting of Het Actuarieel Genootschap.

Simultaneously, the mission and objectives of the Stichting Buiten-universitair voor Actuarieel Onderwijs, an important and valuable 'asset' of the Dutch actuarial community, should be re-examined. One possible direction for the BUOAW is to continue the program for Actuarieel Rekenaar and to assume organizational responsibilities for the newly created education program for Actuarial Analyst. Another direction is to convert the BUOAW into a professionally managed Actuarial Institute for Education, if the University of Amsterdam is not able to meet the educational requirements of Het Actuarieel Genootschap.

### *5.3 Position University of Amsterdam*

To assess how well the Actuarial Department of the University of Amsterdam is positioned to meet the future educational challenges, the following strong and weak points could be listed:

- Strong points
- Belongs to actuarial heritage of Het Actuarieel Genootschap since 1948
  - Only university actuarial department in the Netherlands: less complexities in controlling contents and quality of academic education and research by the profession
  - Growing and promising international academic reputation
  - Well embedded in Faculty of Economics experienced in part time academic education with easy access to education in economic and law subjects

- Weak points
- Subject to academic bureaucracy which may strain control by the profession
  - Uneasy access to other academic disciplines with expertise on financial security systems (Insurance Economics, Insurance Accounting and Insurance Law at Erasmus University Rotterdam, other related disciplines at other universities)
  - No experience in providing support to develop professional standards and guidelines and to develop professional skills such as effective communication and conduct
  - No proven track record on fundamental research relevant to business management and public policy issues
  - Tendency to lack of consistency and cohesion in education programs due to over-representation of part time senior academic personnel

The message from this analysis is clear: remain a viable supplier of actuarial education and research service, it is imperative to the Actuarial Department of the University of Amsterdam to develop a plan to capitalize on its strong points and to remove its weak points.

## 6 Conclusions

1. Het Actuarieel Genootschap faces significant future opportunities and threats from inside and outside the profession. To provide leadership continuity of focus, a strong and well defined Strategic Plan for Education and Research, with a clear vision, mission statement, general objectives and strategies needs to be developed.
2. As the viability of the Dutch actuarial community is at stake, mapping a strategy for the future is an urgent matter. Action plans should be developed in the very near future. To achieve this, the Education Committee should complete its report by the Fall of 1992. Further, a Planning Committee and a Research Committee should commence as soon as possible to develop the plan with clear and tight practical and do-

- able steps to implement the plans.
3. To ensure cohesion and credibility Het Actuarieel Genootschap should pro-actively manage the process of change, as unified as possible avoiding to much delegation to actuarial specialty groups.
  4. The Actuarial Department of the University of Amsterdam has a bright future with tremendous challenges to play a crucial role in the process of change. It has many advantages to start from a position strength, but to become 'A Centre of Actuarial Excellence', the weak points, with the strong support of Het Actuarieel Genootschap, should be addressed diligently and effectively.

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