



SASA • SASV

South African Statistical Association • Suid-Afrikaanse Statistiese Vereniging

SASA: Strategic planning for the future

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An era of great excitement for statistics



- Statistician voted the **fourth** best job in the world!
- There is a fantastic job outlook:
 - Chief Economist at Google, Hal Varian, 2009: “the sexy job in the next 10 years”
 - Google employs more than 250 data analysts
 - I.B.M., 2010; created a Business Analytics and Optimization Services Team
 - over 200 mathematicians, statisticians and other data analysts
 - Wants to expand to 4000 around the world
 - Harvard Business Review of 2012; demand for Data Scientists has raced ahead of the supply
 - Other companies: LinkedIn, Facebook, GE, Google, Amazon, Microsoft, Zinga, Netflix, Kaplan
 - ASA President Robert N. Rodriguez, 2012; the USA require between 140,000 and 190,000 professionals — with expertise in statistical methods by 2018.
- International Year of Statistics 2013!



2013 INTERNATIONAL YEAR OF STATISTICS

RECOGNIZING THE CONTRIBUTIONS OF STATISTICS TO SOCIETY WORLDWIDE



Many new career opportunities



Industry



Statistics are in high demand
New professional being created
Data Scientist, Data Analytics , and
Big Data
Business Analytics
Risk Manager
Customer Analytics
Geo-analytics Analyst
Financial Engineer
Statisticians, Mathematicians and
Computer Scientists
Genetics, Health, Medical,
Agriculture, Environmental, Space,
Statistical engineering



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***Concern: Statisticians are not
necessarily in high demand***

Some Characteristics of the New Trends



- Harvard Business Review of 2012; Consultant; the dead zone!
- Data Scientists:
 - high-ranking professional with the training and curiosity to make discoveries in big data
 - solid foundation in mathematics, statistics, probability, computer science, and communication and business skills
- Business Analytics (source: Prof Riaan de Jongh):
 - The science of using quantitative techniques to solve business problems

Des Nicholls, 1999: *“While new research areas have developed as a result of technological advances, it is unfortunate that statistics researchers (other than a few individuals in each case) have not pursued a number of these and worked in with other disciplines such as computer science (e.g. data base management and data mining).”*

Some Characteristics of the New Trends



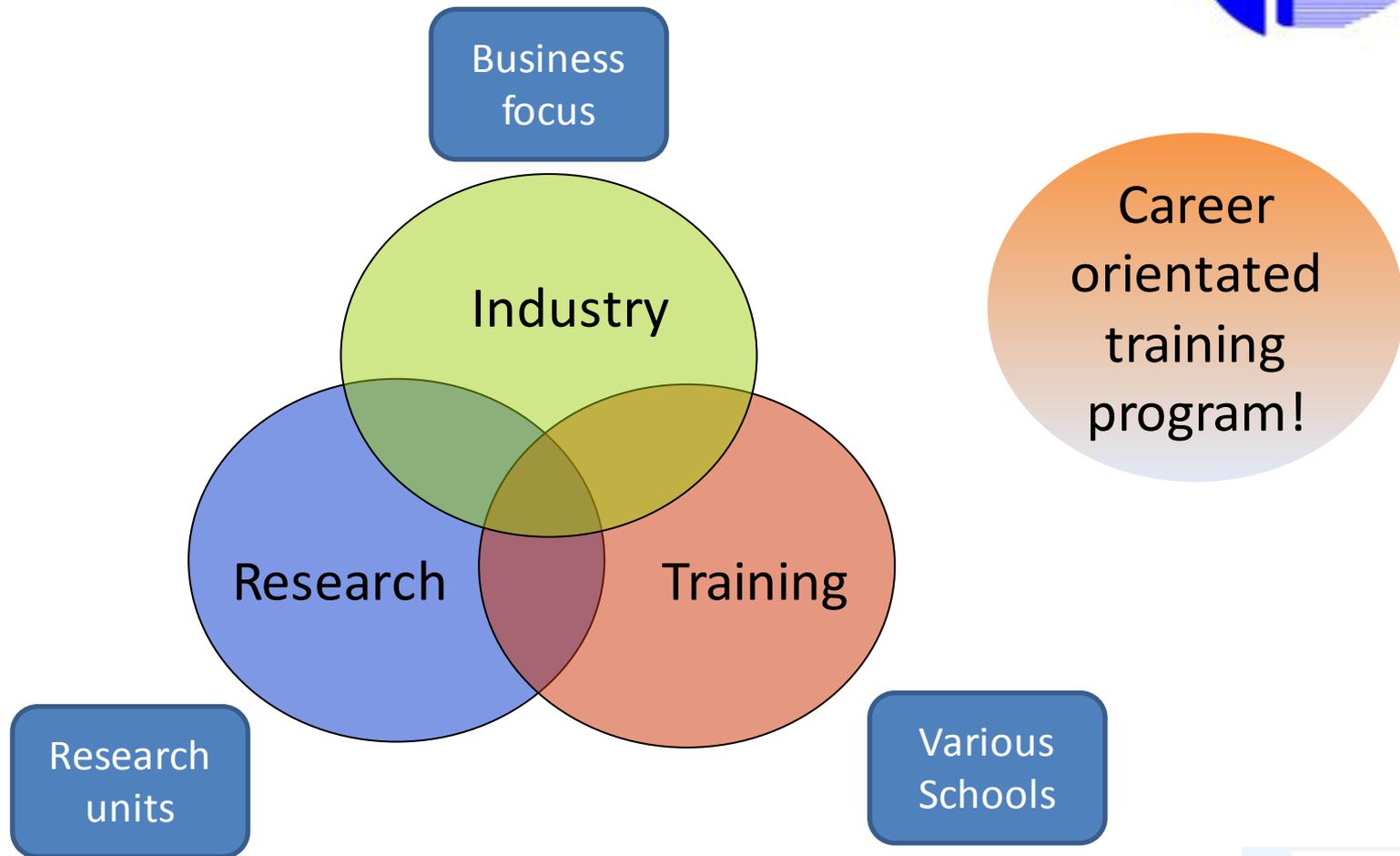
- Hoerl and Snee, 2010:
 - *“The current status of statistics in industry is strong; however, the status of statisticians in industry is possibly at an all-time low.”*
 - In the 21st Century, society needs statistics to be primarily an engineering discipline i.e., we need to recognize that statistics is both an engineering discipline and a pure science.
 - Statistical engineering:
 - *“The study of how to utilize the concepts, methods and tools of statistical and other sciences, and mathematical concepts, to deliver process (business) intelligence and insight, and generate value add”.*

Some Characteristics of the New Trends



- Harvard Business Review of 2012 :
 - Pure statisticians and quantitative analysts - great at analysing data
 - Data management experts - great at generating and organizing data in a structured form
 - New generation data analysts/scientists - must have all of the above, and social and business communications skills to be effective.
- ASA President Robert N. Rodriguez, 2012:
 - Need to engage with data scientists outside the ASA who are involved in Big Data problems, research and technology
 - Explain to the media and the public why statisticians are essential in this emerging field and how their contributions are providing value to consumers of Big Data
 - Providing training that prepares ASA members to work with Big Data

Some Characteristics of the New Trends



Source: Prof Riaan de Jongh

Some Characteristics of the New Trends Data Analytics



Murray de Villiers, 2013: Never before in history have the discipline of Statistics and Statisticians been in a better position for self-actualisation:

We live in a world where computing technology, processing capability, storage capacity and software functionality have successfully overcome some major obstacles in order to provide the world with High Performance computing, Cloud Storage and Computing, Data Quality and Management and Big Data Analytics. ***We are witnessing the greying of boundaries between disciplines such as Forecasting, Statistics, Operations Research, Artificial Intelligence, Financial Engineering, Industrial Engineering, Information Science, Informatics and Computer Science – into the new world of Data Analytics.*** The needs, infrastructure and resource requirements of Companies and Government Departments are maturing to the point of demanding integration of these converged disciplines into their strategy, decision-making and operations. This provides ***new challenges and employment opportunities that we were unaware of ten years ago, such as a Data Scientist, Deep Analytics Consultant, Computational Business Analyst and the Advanced Analytics Practitioner.*** But this also leaves us, as analytics consumers, analytics practitioners and academics with the responsibility to ***adequately develop our youth in order to be well prepared for their future.*** A future that transcends from learning individuals, to learning organizations, to a learning world.



Some Characteristics of the New Trends



Bradley Efron, 2007: “At this point I feel the definite need for some new Fishers and Neymans. A relatively safe prediction is that some sort of Bayesian-frequentist compromise will blossom in the near future of statistical theory. In fact, attitude change is already in the air, at least in the world of statistical applications.”



Industry and Academia - Interconnected



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Academia

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Statistics students are increasing
Demand for lecturers increasing to
train students
Demand for basic research
increasing
Not enough high qualified,
proficient and experienced
professors
Too few people following academic
careers
Students get job offers with high
remuneration
Academic career not seen as
attractive anymore



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***Summary: Academic Statistics in
Crisis in South Africa***



Academic Statistics in Crisis



- Highlighted by recent NRF call for proposals for a Centre of Excellence (CoE) in the mathematical and statistical sciences and the 2008 DST Review on the status of the mathematical sciences
- Ms Yoko Chhana, 2010: “we are facing a crisis in statistical capacity”
- Dr Herrie van Rooy, 2012: “it is time for creative solutions”
- Culprits:
 - the popularity of the subject of Statistics is largely responsible for the crisis in academic Statistics
 - students are in high demand in industry and employed with salaries that universities find difficult to match

Academic Statistics in Crisis



- Consequences:
 - Following demand from industry a substantial number of masters' students are produced
 - Very few PhD graduates are produced each year
 - There exists a lack of professors who are able to provide supervision
 - Many universities are unable to fill positions at associate professor and full professor level
 - Very few students actually pursue academic careers

Academic Statistics in Crisis



- With the inputs from a number of interested and concerned academics, we compiled a letter, dated 18 June 2013, to:
 - Minister Derek Hanekom, Minister of the Department of Science and Technology (DST), Dr Albert van Jaarsveld, CEO of NRF and Dr Philemon Mjwara, Director General of DST
 - to call for a national intervention on the highest level in government to take note of the crisis in Academic Statistics.
 - the letter was endorsed by 12 Heads of Departments of Statistics as well as ABSA and the International Statistics Institute.
- 29 July 2013; A meeting was held between SASA representatives and Dr Albert van Jaarsveld, Dr Andrew Kaniki and other members of the NRF Executive Management
 - The NRF assured us of their commitment to solving the crisis in Academic Statistics
- SASA committee:
 - Prof Riaan de Jongh, Prof Tertius de Wet, Prof Andriette Bekker, Prof Francesca Little, Dr Sonali Das, Prof Freek Lombard and Dr Roelof Coetzer



Academic Statistics in Crisis



- Committee prepared a draft proposal to the NRF, 2 September 2013:
 - find ways of assisting the available pool of senior lecturers / associate professors in becoming more confident to supervise MSc and co-supervise PhD students
 - attract top students to study towards a PhD in theoretical or applied statistics supervised by top rated scientists, locally and/or internationally
 - sensitise industry and tertiary education decision makers about the national crisis in academic Statistics and its negative ramifications
 - pool resources from universities and utilise retired professors to develop advanced courses that could be shared at MSc and PhD level
 - University Departments may also actively liaise with experienced Statisticians at the various Science Councils and in Industry



Academic Statistics in Crisis



- Appropriate governance must be in place to perform the following functions:
 - Identify and select capable **students** who show a definite interest in pursuing an academic career in Statistics.
 - Draft the conditions for **student bursaries** (parties involved probably the student, NRF and universities).
 - Allocate bursaries to selected students.
 - Identify **top supervisors** locally and abroad who can act as co-supervisors, and who are interested in addressing the national problem.
 - Facilitate co-supervisor allocation to students in collaboration with HOD's of different university departments.
 - Devise **appropriate funding schemes** for remuneration of supervisors, co-supervisors and research collaborators.
 - Network with **international researchers** in order to recruit them as co-supervisors for students and research collaborators.
 - Negotiate post-doc positions both locally and abroad.
 - Identify and select post-doc candidates.
 - Allocate funds and research collaborators to post-doc candidates.
 - Derive criteria for performance agreements and appraisals for supervisors, students and post-docs.
 - Liaise and network with universities regarding student and post-doc performance.
 - Organise annual workshops to bring together research collaborators, post-docs.
 - Facilitate **research collaboration amongst universities, Science Councils and Industry.**

Academic Statistics in Crisis



The engagement with the NRF will ensure that the crisis in academic statistics is being addressed on a national level.

This is probably the most important project that the statistics community in South Africa ever had to engage in.



SASA Strategy



- The SASA EC engaged in a strategic planning process in order to provide support to, and growth for, the statistical community in SA
- SWOT analysis:

Strengths
Membership of SASA
Annual conference of high quality
Established journal of high quality
Communication to its members e.g. Web site and Newsletter
Business and government partnerships
Bursary scholarships and competitions
Governance

SASA Strategy



- The SASA EC engaged in a strategic planning process in order to provide support to, and growth for, the statistical community in SA
- SWOT analysis:

Strengths	Opportunities
Membership of SASA	High demand for statistics
Annual conference of high quality	Data Analytics and Data Scientists
Established journal of high quality	maths4stats initiative
Communication to its members e.g. Web site and Newsletter	Marketing and training of statistics at school
Business and government partnerships	Internet and social media
Bursary scholarships and competitions	Business and government partnerships
Governance	Engagement with DoE, DST and the NRF
	Short courses and workshops in specialised fields
	ICCSSA accreditation for courses and workshops
	ICCSSA registration for professionalism
	Many young people in the association

SASA Strategy



- Require new Vision and Missions Statements

Vision:

To be the leading African statistical association, internationally recognized for advancing statistical practice, applications and research in all areas of society, for publishing quality research in leading statistical journals, improving statistical education, and promoting awareness and value-add of statistics and the statistical profession

SASA Strategy



- Require new Vision and Missions Statements

Mission:

- to create a forum for nurturing, attracting and retaining statisticians in South Africa, and advancing their interests;
- to actively market the discipline of statistics in order to improve the general perception and appreciation of the discipline
- to support members by providing a platform for networking opportunities and publications
- to produce timely and high quality up-to-date publications, including the SASJ and the Conference Proceedings, and communicate to its members relevant information and news through the Newsletter.
- to serve the national interest by means of promoting the registration of members at the Institute of Certificated and Chartered Statisticians of South Africa (ICCSA) in disciplines relating to the application of the science of statistics



SASA Strategy



- **I call for SASA to:**
 - be the strategic vehicle for developing and implementing strategic objectives for the advancement of theoretical and applied statistics in SA.
 - develop the strategic intent to be the preferred home for all statisticians working in all areas of theoretical and applied statistics, irrespective of background in training, experience, expertise, or application.
 - support the SASA/NRF initiative in rebuilding academic statistics capacity in South Africa.
 - for the members to be active in all SASA projects and the annual conference
 - for the pro-active collaboration between SASA and ICCSSA to establish a healthy and high-in-demand statistics profession in SA



Thank you!