

## ANNUAL REPORT (2016)

### CENTRE FOR RESEARCH IN INFORMATION AND CYBER SECURITY (CRICS)

Prof Rossouw von Solms

EBEIT

<p>This annual report and the audited financial statement were approved by the Faculty on the _____ day of _____ 20..</p>			
	Print name	Signature	Date
Entity leader	<b>Rossouw von Solms</b>		
Finance	<b>Rheinard van Onselen</b>		
Chairperson of Governing Board (If applicable)			
Chairperson: Faculty Board/ Faculty RTI Committee			
Dean			
DVC: RE (when applicable)			

## 1. Mission / purpose

State the mission or purpose of the entity

The general objective/purpose of CRICS will be to address all types of activities that can assist in enhancing information and cyber security in general. Obviously one of the main goals is to be very academic and research inclined. Postgraduate research and research papers as outputs will play an important role. Along with this, activities to assist and enhance information and cyber security in the community, the government, corporates, etc. will take place. A number of projects are already taking place, such as; assisting schools to educate children, organizations to raise security awareness, policy proposals to governmental departments, etc. Thus, the goal of CRICS is to ensure all of these activities are taking place from one coordinating body, namely CRICS.

### 1.1 Alignment with vision and mission of the NMMU

State briefly how the mission or purpose of the entity aligns with the vision, mission and strategic objectives of the NMMU.

The security of information and cyber related services are truly multi-disciplinary in nature. CRICS functions in close relationship with the NMMU's Institutional Research Theme called 'Cyber Citizenship'. CRICS aims to focus primarily on the security aspects related to Cyber Citizenship.

## 2. Governance structures

List the governance structures associated with the entity together with a list of members' names and affiliations. Mention any changes in the governance structures and changes in membership.

CRICS Advisory Board:

- Dean – Dr Oswald Franks
- DoS – Dr Sue Petratos
- Director of CRICS – Prof Rossouw von Solms
- External member for academia – Prof Basie von Solms (UJ)
- External member from industry – Dr Jackie Phahlamohlaka (CSIR)
- Consultative members – Prof Matt Bishop (USA)
- Consultative members – Prof Steven Furnell (UK)

CRICS Management Committee:

- Director of CRICS – Prof Rossouw von Solms
- DoS – Dr Sue Petratos
- Senior staff members in CRICS – Prof Reinhardt Botha

No changes occurred in membership, taking into account that CRICS was only launched in October 2015.

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2.1 Governance Structure meetings

List meetings held during the year and highlight any decisions that had a direct influence on the activities of the entity.

On 30 October 2015 the first Advisory Board meeting was held. This meeting took place directly after the launch and no influential decisions were made at this meeting.

A formal Management Committee meeting was held on 23 June 2016.

Due to the #FeesMustFall student protests, no Advisory Board meeting was held towards the end of 2016. On 27 February 2017 an Advisory Board meeting was held, chaired by the dean (Dr Ossie Franks).

3. **Staff Members**

List the names and positions of staff members of the entity.

The following staff members are part of CRICS, but are full-time staff members in the School of ICT.

- Prof Rossouw von Solms
- Prof Reinhardt Botha
- Prof Johan van Niekerk
- Prof Kerry-Lynn Thomson
- Prof Mariana Gerber
- Prof Lynn Fatcher

3.1 Human resources issues

Discuss any human resources matters, as appropriate – for example, staff turnover, resignations, appointments *etc.*

None
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4 **Goals / targets for the year under review**

4.1 Statement of goals / targets

Briefly indicate the goals or targets that the entity set for the year under review. It is recommended that you do this in point form.

As far as possible, these should be quantifiable (Research outputs, creation of new intellectual property, commercialisation of IP, patents registered, technology transfer, non-formal teaching, community service and engagement, human resource development and other significant outputs. *e.g.* number of patients counselled, events held, *etc.*)

CRICS's objectives:

- To draw together and host the research efforts and endeavours related to information and cyber security;
- To conduct and disseminate research in the fields of Information and Cyber

Security, and

- To engage with governmental, public and private organizations and society at large towards the implementation of safe and secure information and cyber security practices.

Typical outputs related to the objectives stated above:

- To operate, function and be known as an internationally renowned research group in the area of information and cyber security;
- To supervise and successfully graduate as many as possible post-graduate students in the aforementioned fields;
- To publish as many related research publications through: journal papers, conference papers and contributions to books.

**Note:** It is assumed that the performance and wellbeing of CRICS will be assessed against these set objectives.

#### 4.2 Strategies employed to achieve goals/target

Briefly state the strategies and actions employed by the entity in order to achieve its stated goals / targets.

Typical strategies and actions employed to meet objectives:

- To attract quality post-graduate students, both from within the NMMU as well as from outside the NMMU (mostly part-time students);
- To create a favourable and stimulating on-campus atmosphere for post-graduate students (e.g. a modern laboratory/office environment);
- To ensure a healthy relationship exist between the supervisors and students (e.g. Café Gigabyte – post-graduate student and supervisor cafeteria);
- To build and maintain a healthy, pleasant and focussed group culture between senior members of CRICS;
- To create opportunities for post-graduate students to grow and excel with respect to their research experience (e.g. weekly research colloquiums);
- To keep close relationships with other information and cyber security research groups, both nationally and internationally (e.g. at UNISA, UJ and Plymouth).

#### 4.3 Output

Provide information regarding the output of the entity: for example, research outputs, creation of new intellectual property, commercialisation of IP, patents registered, technology transfer, non-formal teaching, community service and engagement, human resource development and other significant outputs. e.g. number of patients counselled, events held, etc. (See attached template for reporting research outputs/activities - Appendix A)

See Appendices A & B

#### 4.4 Self-assessment of achievement of goals/targets

Discuss the extent to which you achieved your goals or targets. Provide measurements as far as possible.

Studying Appendices A & B it is clear that CRICS did really well from a quantitative point of

view.

From a qualitative point of view it is also clear and noticeable that the full-time (on campus) post-graduate students related to CRICS are a happy group of students, enjoying their studies whilst progressing exceptionally well. The underlying and mutual group dynamics amongst CRICS students and between students and supervisors are ensuring a healthy and productive atmosphere that enhances success.

Five ex-CRICS student members joined KPMG at the beginning of 2017. See Appendix C.

Staff members that form part of CRICS are excelling as well. All six staff members have now been promoted to professorial level (obviously their individual research outputs played a huge role), four of the six members acquired NRF ratings, all members are supervising extensively and the group culture emits mutual respect, focus and fun that all contribute to a healthy and stimulating environment.

#### 4. Highlights and special achievements

List highlights and/or special achievements for the year under review: for example, awards, special events, important visitors *etc.*

CRICS completed an IT Governance in Local Government, involving five MIT students, at the end of 2016. The project involved the Eden District Municipality as primary municipal participant as well as 22 smaller local municipalities from rural Eastern Cape.

Secondly, the fact that 11 journal papers (in accredited journals) and 20 conference papers were published in 2016 is indeed a wonderful achievement.

#### 5. Finances

##### 5.1 Financial review

Provide a brief overview of the financial position of the entity and any matters of particular significance from a financial point of view (for example, major contracts awarded, donations received / renewed / lost, *etc.*).

If the entity ran at a deficit, discuss the reasons for the deficit and the remedial steps necessary to rectify the situation.

CRICS has no specific funding resources. The funding used to conduct the business related to CRICS all stem from research entities related to the members of CRICS.

In all cases the individual research, incentive funding (NRF rated members), Thuthuka and engagement entities were used to fund all CRICS related research and engagement-related financial expenses. All of these expenses are dependent on normal NMMU rules & regulations.

Entities applicable are:

Prof R von Solms: H223, M037 & N263  
Prof Johan van Niekerk: H344, M027 & 3502  
Prof Mariana Gerber: H248 & M011  
Prof Reinhardt Botha: H232, H254 & M038  
Prof Kerry-Lynn Thomson: G470 & L243  
Prof Lynn Fletcher: H363 & L280

As CRICS was only launched late 2015, the cost centre H988 was allocated to CRICS. It

started with an amount of R52760.30. The only expense for 2016 was the appointment of an admin assistant and the current balance is R20126.56.

CRICS also arranged the annual ACCC2016 conference, and a profit of about R50 000 was made. This is reflected in the cost centre: N263.

## 5.2 Financial statements

Use the attached template from Finance to provide audited statements of income and expenditure, and a balance sheet, for the year under review. Contact Mr Pierre Knoesen in the Department of Finance in this regards.

See attached financial statements for cost centre H988 and N263 as Appendix D.

## 6. **Additional information**

Provide any additional information regarding the year under review which is deemed significant and is not covered under the above headings.

CRICS successfully attracted Dr Nader Sohrabi Safa as a PostDoc in the latter half of 2015 and the first half of 2016. He proved to be a real asset to CRICS.

## 7. **Mandatory Summary for Senate**

Kindly condense this report into a one paragraph summary (no more than 10 lines) for the attention of Senate.

The members of CRICS are all very productive as keen researchers and supervisors. Further, all six members of CRICS have now been promoted to professorial level. In total 11 journal publications and 20 conference papers were published during 2016. Three master's students and two PhD students that graduated in 2016 were supervised by CRICS members. The fact that the December graduation ceremonies were cancelled did influence the number of graduates negatively.

CRICS also successfully attracted a PostDoc in the latter half of 2015 and the first half of 2016. Dr Nader Sohrabi Safa from Malaysia really proved to be a real asset in co-authoring four published journal papers.

**The annual report must be DATED AND SIGNED by the Director, Manager or Head of the Entity, the Chairperson of the Governance Structure, and the Dean.**

**APPENDIX A  
RESEARCH OUTPUTS/ACTIVITIES (2016)**

<b>OUTPUTS/ACTIVITIES</b>	<b>NO</b>	<b>DETAILS</b>	<b>STAFF INVOLVED</b>	<b>OTHER (Specify)</b>
<b><u>CONFERENCES</u></b>				
International Conferences (Published Papers)	15*			
National Conferences (Published Papers)	5*			
International Conference (presented but not published papers)				
National Conference (presented but not published papers)				
International Conferences (only attended)				
National Conferences (only attended)				
<b><u>JOURNAL ARTICLES</u></b>				
International indices (ISI, IBSS & Scopus)	9*			
DoE list of South African Journals	2*			
Other Peer-reviewed Journal Articles				
<b><u>BOOKS AND BOOK CHAPTERS</u></b>				
<b><u>RESEARCH REPORTS</u></b>				
<b><u>CREATIVE OUTPUTS</u></b>				
<b><u>MASTERS AND DOCTORAL DEGREES COMPLETED</u></b>				
Masters by Coursework and Treatise				
Masters by Research	3	M Mogale  D Skolman  J Louw	Prof M Gerber Prof R von Solms  Prof M Gerber  Prof D van Greunen Prof L Futcher	
Doctoral Degrees	2	J Coertze  N Isabirye	Prof R von Solms  Prof S Flowerday Prof R von Solms	
<b><u>HUMAN CAPITAL DEVELOPMENT</u></b>				
Emerging (Staff & PG Students)				
Established Researchers				
<b><u>ACADEMIC ENGAGEMENT</u></b>				
		Prof Rossouw von Solms was made a Fellow of the Institute for IT Professionals in South Africa (IITPSA)		

<b><u>GRANTS RECEIVED</u></b>				
<b><u>KNOWLEDGE PRODUCTS</u></b>				
Intellectual Property				
IP Commercialisation				
Disclosures				
<b><u>OTHER (Specify)</u></b>				

\* See Appendix B



## CRICS Outputs for 2016

### Journal Publications

No	Author 1	Author 2	Author 3	Title of Paper	Name of Journal	Vol	Pages
1	Sohrabi Safa, N.	Von Solms, R.		An Information Security Knowledge Sharing Model in Organizations	Computers in Human Behaviour	57	442-451
2	Sohrabi Safa, N.	Von Solms, R.	Furnell, S.	Information security policy compliance model in organizations	Computers & Security (COSE)	56	1-13
3	Sohrabi Safa, N.	Von Solms, R.	Futcher, L.	Human Aspects of Information Security in Organizations	Computer Fraud & Security	2016(2)	15-18
4	Adesemowo, K.	Von Solms, R.	Botha, R.	Safeguarding Information as an Asset: Do We Need a Redefinition?	South African Journal of Information Management (SAJIM)	18(1)	
5	Sohrabi Safa, N.	Von Solms, R.		Customers repurchase intention formation in e-commerce	South African Journal of Information Management (SAJIM)	18(1)	
6	Von Solms, R.	Von Solms, B.		Publish or Perish – But where?	South African Computer Journal (SACJ)	28(1)	
7	Von Solms, R.	Willett, M.		Towards Cloud-Computing Assurance	The Social Sciences	18	
8	Reid, R.	van Niekerk, J.		Decoding Audience Interpretations of Awareness Campaign Messages	Information & Computer Security (IACS)	24(2)	
9	van Niekerk, J.	Webb, P.		The effectiveness of brain-compatible blended learning material in the teaching of programming logic	Computers & Education	103	16-27
10	Mooi, R	Botha, R. A.		A Model for Building a Computer Security Incident Response Capability	SAIEE Africa Research Journal	107(2)	78 – 91
11	Haskins, B.	Botha, R.A.		Aligning the Most Frequently Discussed Topics on the Dr Math Service with Those Found on NSC Mathematics Exams	The Journal for Transdisciplinary Research in Southern Africa		
12	Adesemovo, K.	Von Solms, R.	Botha, R.A.	ITAOFIR: IT Asset Ontology for Information Risk in Knowledge Economy and Beyond	Communications in Computer and Information Science: Global Security, Safety and	#630 (series)	173-190

					Sustainability - The Security Challenges of the Connected World		
13	Chiroma, H.	Abdul-kareem, S.	Sohrabi Safa, N.	A Review on Artificial Intelligence Methodologies for the Forecasting of Crude Oil Price	Intelligent Automation & Soft Computing	Vol 22(3)	449-462

## Conference Papers

No	Author 1	Author 2	Author 3	Title of Paper	Name of Conference	City	Country	Date
1	Mabece, T.	Futcher, L.	Thomson, K.	Towards using pervasive information security education to influence information security behaviour in undergraduate computing graduates	International Conference on Information Resources Management (CONF-IRM)	Cape Town	South Africa	May-16
2	Gomana, L.	Futcher, L.	Thomson, K.	An Educators Perspective of Integrating Information Security into Undergraduate Computing Curricula	Human Aspects of Information Security & Assurance (HAISA)	Frankfurt	Germany	Jul-16
3	Fredericks, D.T.	Futcher, L.	Thomson, K.	Comparing Student Password Knowledge and Behaviour: A Case Study	Human Aspects of Information Security & Assurance (HAISA)	Frankfurt	Germany	Jul-16
4	van Niekerk, J.	Thomson, K.		Towards an Interdisciplinary Cyberbullying Campaign	Human Aspects of Information Security & Assurance (HAISA)	Frankfurt	Germany	Jul-16
5	Tekeni, L.	Botha, R. A.	Thomson, K.	An Overview of Access Control Practices: Guidance from ITIL, COBIT 5 and ISO/IEC 27002	Information Institute Annual Security Conference	Las Vegas	USA	Apr-16
6	Delport, P.	von Solms, R.	Gerber, M.	Towards Corporate Governance of ICT in Local Government	IST Africa 2016 Conference	Durban	South Africa	May-16
7	Koen, R.	von Solms, R.	Gerber, M.	ICT Readiness for Business Continuity in Local Government	IST Africa 2016 Conference	Durban	South Africa	May-16
8	de Lange, J.	von Solms, R.	Gerber, M.	Information Security Management in Local Government	IST Africa 2016 Conference	Durban	South Africa	May-16
9	Fani, N.	von Solms, R.	Gerber, M.	Governing Information Security within the Context of "Bring Your Own Device in SMMEs"	IST Africa 2016 Conference	Durban	South Africa	May-16
10	Mcube, U.	Gerber, M.	von Solms, R.	Scenario-based IT Risk Assessment in Local Government	IST Africa 2016 Conference	Durban	South Africa	May-16

11	Fani, N.	von Solms, R.	Gerber, M.	A framework towards governing "Bring Your Own Device in SMMEs"	Information Security South Africa	Johannesburg	South Africa	Aug-16
12	Delport, P.	Gerber, M.	Sohrabi-Safa, N.	An Interactive Library for Awareness on the Secure Handling of Business Information	Information Security South Africa (ISSA) 2016 Conference	Johannesburg	South Africa	Aug-16
13	Scharnick, N.	Gerber, M.	Futcher, L.	Review of Data Storage Protection Approaches for POPI Compliance	Information Security South Africa (ISSA) 2016 Conference	Johannesburg	South Africa	Aug-16
14	Coertze, J.	Von Solms, R.		Communication Factors influencing Business-IT Alignment	ADIBUM 2016	Kralove	Czech Republic	Sep-16
15	Von Solms, W.	Von Solms, R.		Co-creation: Tourism, Technology and Wellness	IST Africa 2016 Conference	Durban	South Africa	May-16
16	de Kock, R	Futcher, L		Mobile Device Usage in Higher Education Institutions in South Africa: A Case Study.	Information Security South Africa	Johannesburg	South Africa	Aug-16
17	Draai, K	Haskins, B	Botha, R. A.	Devising NREN design goals from commercial network design guidelines	IST Africa 2016 Conference	Durban	South Africa	May-16
18	Mooi, R.	Botha, R. A.		Setting the Context for the SA NREN Computer Security Incident Response Team	IST Africa 2016 Conference	Durban	South Africa	May-16
19	Mooi, R.	Botha, R. A.		Prioritizing computer security incident response services for the South African National Research Network (SANReN)	International Conference on Information Resources Management (CONF-IRM)	Cape Town	South Africa	May-16
20	Miya, A	Botha, R. A.		Facebook Mobile Interfaces: A Heuristic Evaluation of Privacy Features	Information Institute Annual Security Conference	Las Vegas	USA	Apr-16

## Graduates

No	Qualification	Student	Title of Dissertation or Thesis	Supervisor	Co-supervisor
1	Master's	Mogale, M	Information Security Assurance Model for an Examination Paper Preparation Process in a Higher Education Institution	Gerber, M.	Von Solms, R.
2	Master's	Skolmen, D	Protection of Personal Information in the South African Cloud Environment: A Framework for Cloud Computing Adoption	Gerber, M.	
3	Master's	Louw, J	User Experience Factors For Mobile Banking Adoption	Van Greunen, D.	Futcher, L.
4	PhD	Coertze, J.J.	A Maturity Grid-based Method for Assessing Communication in Business-IT Alignment	von Solms, R.	
5	PhD	Isabirye, N.	A Framework for Enhancing Trust for improved participation in E-marketplaces accessed from Mobile Platforms	Flowerday, S.	Von Solms, R.

Five CRICS student members from 2016 who joined KPMG IT Advisory in January 2017.



**INCOME STATEMENT OF CRICS von SOLMS**

ENTITY NAME : CRICS VON SOLMS

ENTITY LEADER : Prof von Solms

COST CENTRE(S) : H988

INCOME STATEMENT FOR PERIOD : 2016 2015

Opening Balance 52,760 52,760

**INCOME**

Private grants

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**EXPENDITURE**

Salaries

32,634

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Operating Expenses

30,669	
1,965	

Closing Balance

20,127	52,760
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Signed off by Finance Dept.

Name :

Rheinard van Onselen  
Accountant Research and Third Stream Income

Signature :

  
10/03/2017