ANNUAL REPORT (2017)

CENTRE FOR RESEARCH IN INFORMATION AND CYBER SECURITY (CRICS)

Prof Reinhardt Botha

EBEIT

	Print name	Signature	Date
This annual report and the audited financial statement were approved by the Faculty on the _____ day of _____ 20..			
Entity leader	**Reinhardt A Botha**	*ABotha*	18 July 2018
Finance	**Rheinard van Onselen**		
Chairperson of Governing Board (If applicable)			
Chairperson: Faculty Board/ Faculty RTI Committee	**Reinhardt A Botha**	*ABotha*	18 July 2018
Dean	**Dalenca Pottas**	*signature*	18 July 2018
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.

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 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 Futcher

3.1   Human resources issues

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

The Director of CRICS, Prof Rossouw von Solms, retires at the end of January 2018.

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.

Staff members that form part of CRICS are excelling as well. All six staff members are at a professorial level (obviously their individual research outputs played a huge role), four of the six members have 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.*

12 journal papers (in accredited journals) and 8 conference papers were published in 2017; it is indeed a great 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 Futcher: H363 & L280

CRICS was allocated the cost centre H988. It started 2017 with an amount of R20126.56., abd afer some printing the balance is R 20124.90.

CRICS had to cancel the annual ACCC conference due to a lack of papers received. This is probably indicative of the overall financial position at South African Universities.

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 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.

N/A

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 and keen researchers and supervisors. In total 12 journal publications and 8 conference papers were published during 2017. Nine master's students and one PhD students that graduated in April 2017 were supervised by CRICS members.

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/ACTIVIES (2017)

OUTPUTS/ACTIVITIES	NO	DETAILS	STAFF INVOLVED	OTHER (Specify)
CONFERENCES	8			
International Conferences (Published Papers)	8		Appendix B	
National Conferences (Published Papers)				
International Conference (presented but not published papers)				
National Conference (presented but not published papers)				
International Conferences (only attended)				
National Conferences (only attended)				
JOURNAL ARTICLES	12		Appendix B	
International indices (ISI, IBSS & Scopus)				
DoE list of South African Journals				
Other Peer-reviewed Journal Articles				
BOOKS AND BOOK CHAPTERS				
RESEARCH REPORTS				
CREATIVE OUTPUTS				
MASTERS AND DOCTORAL DEGREES COMPLETED				
Masters by Coursework and Treatise				
Masters by Research	9	R de Kock J de Lange P Delport R Koen C Miya L Tekeni T Mabece N Fani U Mcube	Prof L Futcher Prof R von Solms Prof R von Solms Prof R von Solms Prof RA Botha Prof RA Botha Prof L Futcher Prof R von Solms Prof M Gerber	Prof M Gerber Prof M Gerber Prof M Gerber Prof KL Thomson Prof KL Thomson Prof M Gerber Prof R von Solms
Doctoral Degrees	1	T Tsokota	Prof R von Solms	Prof D Greunen
HUMAN CAPITAL DEVELOPMENT				
Emerging (Staff & PG Students)	46	See Appendix C		
Established Researchers	6			
ACADEMIC ENGAGEMENT				
GRANTS RECEIVED				
KNOWLEDGE PRODUCTS				
Intellectual Property				

IP Commercialisation				
Disclosures				
OTHER **(Specify)**				8

CRICS Outputs for 2017

Journal Publications

No	Author 1	Author 2	Author 3	Title of Paper	Name of Journal	Vol	Pages
1	Tsokota, T	Von Solms, R	Van Greunen, D	An ICT strategy for the sustainable development of the tourism sector in a developing country. A case study of Zimbabwe	Electronic journal of Information Systems in Developing countries	78	1-23
2	Gcaza, N	Von Solms, R		A strategy for a cybersecurity culture: A South African perspective	Electronic journal of Information Systems in Developing countries	80	1-25
3	Gcaza, N	Von Solms, R		Cyber security culture: An Ill-defined problem	IFIP Advances	503	98-109
4	Gcaza, N	Von Solms, R		A general morphological analysis: Delineating a cyber-security culture	Information and Computer Security	25	259-278
5	Mcube, U	Von Solms, R	Gerber, M	A Scenario-based information technology risk-assessment for municipalities	Journal of public administration	52	438-453
6	Willet, M	Von Solms, R		Cloud computing assurance - A review of literature guidance	Information and Computer Security	25	26-46
7	Mahonga, S	Gerber, M		Guidelines for a job role-based approach on phising awareness in an organisation	International journal of education economics and development	8	176-190
8	Yekela, O	Thomson, KL	Van Niekerk, J	Assessing the effectiveness of the cisco networking academy program in developing countries	IFIP Advances	503	27-38
9	Futcher, L			Cybersecurity curricular guidelines	IFIP Advances	503	3-13

10	Mabece, T	Futcher, L	Thomson, KL	South African computing educators' perspectives on information security behaviour	IFIP Advances	503	121-132
11	Haskins, B	Botha, RA		Aligning mathematics with tutoring platform topics	The journal for transdisciplinary research in Southern Africa	13	1-9
12	Sohrabi Safa, N	Von Solms, R		Motivation and opportunity based model to reduce information security threats in organisations	Journal of information security and applications	1	1-12

Conference Papers

No	Author 1	Author 2	Author 3	Title of Paper	Name of Conference	City	Country	Date
1	Mdunyelwa, V	Van Niekerk, J	Futcher, L	Secure coding practices in the software development capstone projects	HAISA 2017	Adelaide	Australia	28/11/2017
2	Skinner, S	Van Niekerk, J		Incorporating pedagogical principles into formal game mechanic design using in Machinations framework	Proceedings of the 11th European Conference on games based	Graz	Austria	5/10/2017
3	Van Niekerk, J			The use of brain-compatible educational principles in the design of educational games	Proceedings of the 11th European Conference on games based	Graz	Austria	5/10/2071
4	Futcher, L			Towards the design of a cybersecurity module for postgraduate engineering students	HAISA 2017	Adelaide	Australia	28/11/2017
5	Janse van Rensburg, E	Von Solms, R		Voice recognition as a user-authentication method	ECCWS	Dublin	Ireland	29-30/06/2017
6	Koekemoer, S	Von Solms, R		IT project management maturity in South African Municipalities	IST Africa	Windhoek	Namibia	31-2/06/2017

7	Delport, P	Von Solms, R	Gerber, M	Validation of the framework for corporate governance of ICT in local government	IST Africa	Windhoek	Namibia	31-2/06/2017
8	Mxoli, A	Mostert-Phipps, N	Gerber, M	Information security risks impacting cloud-based personal health records	11th European conference on information systems management	Genoa	Italy	14-15/09/2017

Graduates April 2017

No	Qualification	Student	Title of Dissertation or Thesis	Supervisor	Co-supervisor
1	Master's	R de Kock	A framework for implementing bring your own device in higher education institutions in South Africa	Prof L Futcher	
2	Master's	J de Lange	A framework for information security management in local government	Prof R von Solms	Prof M Gerber
3	Master's	P Delport	A framework for the corporate governance of ICT in local government	Prof R von Solms	Prof M Gerber
4	Master's	R Koen	ICT readiness for business continuity in local government	Prof R von Solms	Prof M Gerber
5	Master's	C Miya	A model for understanding the intention to change Facebook privacy settings on mobile phones	Prof RA Botha	
6	Master's	L Tekeni	A multi-faceted model to support authentication and authorization for online services	Prof RA Botha	Prof KL Thomson
7	Master's	T Mabece	A model to address factors that could influence the information security behaviour of computing graduates	Prof L Futcher	Prof KL Thomson
8	Master's	N Fani	Governing information security within the context of "bring your own device" in small, medium and micro enterprises	Prof R von Solms	Prof M Gerber
9	Master's	U Mcube	A scenario-based ICT risk assessment approach in local government	Prof M Gerber	Prof R von Solms
1	PhD	T Tsokota	An ICT strategy sustainable tourism in Zimbabwe	Prof R von Solms	Prof D van Greunen

Students enrolled for post-graduate studies and supervised by CRICS members during 2017

Supervisor	Student	Student	Gender	Race
Prof J van Niekerk		R Leppan	Male	White
		C Marais	Male	White
		R Reid	Female	White
	S Goldstone		Male	White
	K Terblanche		Female	Black
	V Mdunyelwa		Male	Black
	S Skinner		Male	White
	M Magagne		Male	Black
Prof R von Solms		S Koekemoer	Female	White
		M Sibanda	Male	Black
		P Delport	Male	White
		K Adesemowo	Male	Black
		N Gcaza	Female	Black
	R Maharaj		Male	Indian
	E Janse van Rensburg		Male	White
Prof RA Botha		T Agbor Kandeh	Male	Black
		T Muchenje	Male	Black
		D Boucher	Male	White
	B Mathew		Male	Indian
	J van Heerden		Male	White
	Z Webster		Male	Coloured
	B Coetzee		Male	White
	L Rheeder		Male	White
	K Draai		Male	Coloured
Prof L Futcher	L Kucherera		Female	Black
	M Markgraaff		Male	White
	D Fredericks		Male	Coloured
	L Gomana		Female	Black
Prof KL Thomson		D Von Schoultz	Male	White
	O Yekela		Male	Black
	W Janse vanRensburg		Male	White
Prof M Gerber	T Speckman		Male	Black
	R Mphela		Male	Black
	S Mhlaba		Male	Black
	N Scharnick		Male	White
	S Mahonga		Female	Black

Demographic summary of staff and students involved in CRICS

	MIT	PhD	Staff	Grand Total
Black	**10**	**5**		**15**
Female	4	1		5
Male	6	4		10
Coloured	**2**			**2**
Male	2			2
Indian	**2**			**2**
Male	2			2
White	**10**	**7**	**6**	**23**
Female		2	3	5
Male	10	5	3	18
Grand Total	**24**	**12**	**6**	**42**

INCOME STATEMENT OF CRICS von SOLMS

ENTITY NAME :   CRICS VON SOLMS

ENTITY LEADER :   Prof von Solms

COST CENTRE(S) :   H988

INCOME STATEMENT FOR PERIOD :	**2017**	**2016**
Opening Balance	**20,127**	**52,760**
INCOME	-	-
Private grants	-	-
EXPENDITURE	**2**	**32,634**
Salaries		30,669
Operating Expenses	2	1,965
Closing Balance	**20,125**	**20,127**

Signed off by Finance Dept.

Name :   Rheinard van Onselen
                    Accountant Research and Third Stream Income

Signature :

20/7/2018