2020 ANNUAL REPORT

Entity name: CENTER FOR RESEARCH IN INFORMATION AND CYBER SECURITY (CRICS)

Entity Leader: PROF RA BOTHA

Faculty: ENGINEERING, THE BUILT ENVIRONMENT AND TECHNOLOGY

This annual report and the audited financial statement were approved by the Faculty Board on the _____ day of _____ 20..

	Print name	Signature	Date
Entity leader	**PROF RA BOTHA**	*Botha*	**7 APRIL 2021**
Finance			
Chairperson of Advisory Board (If applicable)			
Chairperson: Faculty Board/ Faculty R&E Committee			
Dean	**PROF B VAN WYK**		
DVC: RII (when applicable)			

1.   Mission / purpose

The general objective/purpose of CRICS is to address all types of activities that can assist in enhancing information and cybersecurity in general, specifically from an academic and research perspective. Given the academic and research focus of CRICS, postgraduate research and communication via research papers are our primary purpose. Along with this, activities to assist and enhance information and cybersecurity in the community, the government, and business are supported. Thus, the goal of CRICS is to ensure all of these activities take place from one coordinating body, namely CRICS.

1.1   Alignment with Nelson Mandela University Strategic Objectives

Discuss how the entity contributed to the following University strategic areas

a.   The institutional research themes or Faculty strategic priorities

The increasing reliance of all spheres of life on digital technologies raises the awareness and need for information and cybersecurity. As such the research done within CRICS addresses important underpinning for the "Innovation and Digital Economy" research theme.

b.   Contributions to trans-disciplinarity

Information and Cybersecurity touches many fields. Of particular interest to CRICS are psychology and law.

c.   Revitalisation of the Humanities (where applicable)

N/A

d.   International partnerships including the African footprint

The involvement of various staff members in international forums, led to fostering specific (albeit informal) ties with similar research groups at other universities, such University of Plymouth, Goethe University (Frankfurt), University of Nottingham, and University of California at Davis. On the African front relations mainly exist with South African Universities, in particular UNISA, University of Johannesburg and University of Pretoria.

e.   Sustainable development goals

Goal 9 of the sustainable development goals has as one of its targets to "significantly increase access to information and communications technology". The advantages this brings are obvious, but the increased risk receive less attention. Research in information and cyber security aims to recognise and reduce the risk associated these risks through both technical and behavioural interventions.

f.   Public engagement, science communication and advancement

CRICS encourages members to be involved in community activities and communicate with the wider world through news media. CRICS also influence wider policy by contributing to international working groups.

g.   Any other area of strategic importance

Through post-graduate supervision CRICS hopes to contribute significantly to human resource development in an discipline with serious shortages.

1.2   Executive Summary for Senate (no more than half a page)
This section highlights the achievements of the entity and draws attention to any strategic risks that the entity is facing.

CRICS primarily contributed through post-graduate supervision and research publications . In total 6 journal publications and 3 conference papers were published during 2020. During 2020, 14 Masters and 4 PhD students graduated.

2. Governance structures

Indicate the governance structures that are in place (indicate with X)

Governance structure	YES	NO
Advisory Board	YES	
Management Committee	YES	
Other (please specify)		

The **CRICS Advisory Board** consists of:

- Dean/Deputy Dean – Prof Ben van Wyk / Prof Dalenca Pottas
- DoS – Dr Sue Petratos
- Director of CRICS – Prof Reinhardt A Botha
- Mr Samrej Ramjith – Partner, Cybersecurity, E&Y (changed jobs during 2019, now with ABSA)
- Mr Agbor Kandeh – CIO, SA Postbank
- Ms Susan Potgieter – Head: Relationship Management, SABRIC
- Mr Gustav d'Assonville – Manager, Technology Advisory: Eastern Cape, KPMG
- Mr Jaco Maass – General Manager Information & Communication Technology, BKB
- Dr Noxi Gcaza – Cybersecurity Researcher, CSIR. (changed jobs during 2019, now with TUT)
- Dr Jackie Phahlamohlaka – Competency Area Manager, DPSS, CSIR.
- Mr Nick Hall – Senior Security Engineer, Dimension Data

CRICS Management Committee:

- Director of CRICS – Prof Reinhardt Botha
- DoS – Dr Sue Petratos
- Senior staff members in CRICS – Profs Lynn Futcher, Mariana Gerber and Kerry-Lynn Thomson

2.1 Governance Structure meetings

Governance structure	Date of meeting	Minutes attached (Yes/No)
Advisory Board	30 Nov 2020	No

3.   Staff, Research Associates, HEAVA members, Postdoctoral Fellows and Research Fellows

Name	Gender	Department/Institution	Position
Prof Reinhardt A Botha	M	IT Management & Governance	Professor
Prof Kerry-Lynn Thomson	F	Network Engineering	Professor
Prof Mariana Gerber	F	IT Management & Governance	Associate Professor
Prof Lynn Futcher	F	IT Management & Governance	Associate Professor
Mr Luzuko Tekeni	M	Network Engineering	Lecturer
Mr Phumezo Ntlatywa	M	IT Management & Governance	Lecturer
Mr Vuyolwethu Mdunyelwa	M	Software Engineering	Lecturer
Mr Timothy Speckman	M	Network Engineering	Associate Lecturer
Prof Steve Furnell	M	University of Nottingham, England	Honorary Professor
Prof Johan Van Niekerk	M	Noroff University College, Norway	Honorary Professor
Dr Renier van Heerden	M	CSIR	Research Associate
Prof Rossouw von Solms	M	Retired	Emeritus Professor
Dr Noxi Gcaza	F	CSIR	Research Associate

3.1   Human resources issues

CRICS consists of 8 staff members whose primary research interests are information and cybersecurity. Four of the eight staff members have yet to obtain their PhDs. 2 senior staff members, Profs von Solms and Van Niekerk, left the university during 2018, and while they remain involved as Emeritus and Honorary professors respectively, they left a big void in School of IT, in general, and CRICS specifically, even in 2020 as their positions remain unfilled.

The creation of new programmes and the shift over to a new qualification structure put a heavy burden on staff in CRICS, who receive no support (or incentive) to be involved in CRICS. It comes as no surprise then that CRICS' activities often are moved to the wayside as they are considered secondary. Furthermore, the lecturing load on team members, specifically those who need to complete their PhDs, makes it extremely challenging to sustain progress.

4   Performance for the year under review

4.1   Statement of goals / targets

CRICS's objectives:

- To draw together and host the research efforts and endeavors related to information and cybersecurity.
- To conduct and disseminate research in the fields of Information and Cyber Security.
- To engage with governmental, public and private organizations and society at large towards the implementation of safe and secure information and cybersecurity 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 cybersecurity.
- To supervise and successfully graduate post-graduate students in the aforementioned fields.
- To publish related research publications through journal papers, conference papers and contributions to books.

4.2   Strategies employed to achieve goals/target

Typical strategies and actions employed to meet objectives:

- To attract quality post-graduate students, both from within the Nelson Mandela University as well as from outside the Nelson Mandela University (mostly part-time students);

- To create a favorable and stimulating on-campus atmosphere for post-graduate students (e.g. a modern laboratory/office environment);
- To ensure a healthy relationship exists between the supervisors and students (e.g. Café Gigabyte – post-graduate student and supervisor cafeteria);
- To build and maintain a healthy, pleasant and focused 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 cybersecurity research groups, both nationally and internationally.

4.3   Summary of Research Performance at a glance

Number of Masters students enrolled	**18**
Number of Masters students graduated	April: **8** December: **6**
Number of PhD students enrolled	**9**
Number of PhD students graduated	April: **2** December: **2**
Number of journal articles published	**6**
Number of book chapters published	-
Number of books published	-
Number of conference proceedings published	**3**
Number of creative outputs produced	-
Other notable research outputs	-

4.4   Self-assessment of achievement of goals/targets

1.   CRICS manages to provide a virtual home for students working in the fields of information and cybersecurity. The number of enrolments and graduating students attest to that. CRICS find it difficult to sustain quality supervision at the level of interest shown. The school recognised the interest and skills, and created qualifications that will boost this even more.

2.   CRICS are successful at disseminating research. 6 journal publications and 3 conference publications attest to that.

3.   The pandemic made it impossible to work on our on-campus presence, and may have harmed the feeling of belonging and unity significantly. Only time will tell how much of an impact that had on our research productivity.

5.   Highlights and special achievements

Prof Lynn Futcher was nominated as an IFIP TC-11 Category "C" member at the 2020 IFIP TC-11 AGM held on Sunday, 20 September from 1000h GMT until 1300h GMT.

Prof Rossouw von Solms received an NRF B2-rating for 2021 – 2025.

Prof Reinhardt A Botha was appointed to the Computer & Security journal's Editorial Board. According to the Journal Citation Reports (JCR), Computers & Security has a 5-year impact factor (2015-2019) of 3.579, which ranks it 38th of the 147 Computer Science journals listed in JCR.

Prof von Solms received an Emerald Literati Award for a paper entitled "How does Intellectual Capital Align with Cyber Security?" co-authored with Profs Basie von Solms (UJ) and Karen Renaud (Abertay) and published in the Journal of Intellectual Capital in 2019.

Prof Kerry-Lynn Thomson continues to serve as the IFIP 11.12 WG Chair – Human Aspects of Information Security and Assurance.

6.   Finances

6.1   Financial review

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 Nelson Mandela University rules & regulations.

Entities applicable are:

Prof Mariana Gerber: H248 & M011
Prof Reinhardt Botha: H232, H254 & M038
Prof Kerry-Lynn Thomson: G470 & L243
Prof Lynn Futcher: H363 & L280

Prof R von Solms: H223, M037 & N263
Prof Johan van Niekerk: H344, M027 & 3502

CRICS was allocated the cost centre H988. It started 2020 with an amount of R 744.75 which was unused and thus remained at the end of 2020.

6.2   Financial statements

See attached financial statements for cost centre H988.

7.   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

The annual report must be DATED AND SIGNED by the Chairperson of the Advisory Board (if applicable), Faculty Board, Dean, and Director of the research entity.

OUTPUTS/ACTIVITIES	NO	DETAILS	STAFF INVOLVED	OTHER (Specify)
JOURNAL ARTICLES				
International indices (ISI & IBSS)	6	IEEE Access. AJBER, Springer AICT, Springer CCIS	L Futcher, R von Solms, K-L Thomson, V Mdunyelwa, RA Botha, J van Niekerk, S Furnell	S von Solms, S Koekemoer, D von Schoultz, NB Mogabane
CONFERENCES				
International Conferences (Published Papers)	1	19th Sceurity Conf, LV	S Furnell	
National Conferences (Published Papers)	2	SACLA	L Futcher, K-L Thomson, V Mdunyelwa, J van Niekerk	A Mbuge
BOOKS AND BOOK CHAPTERS				
RESEARCH REPORTS				
CREATIVE OUTPUTS				
POST-GRADUATE QUALIFICATIONS COMPLETED				
MASTERS COMPLETED				
Masters by Coursework and Treatise	8	MO Khumalo S Sandi MB Sekhwela ML Sigasa N Siwela NU Mabaso E Mathase MJ Siziba		
Masters by Research	6	S Bangani R Evezard B Mathew Z Manjezi A Mbuqe L Kucherera		
DOCTORAL DEGREES COMPLETED	4	S Koekemoer T Muchenje P Delport S Mbusi		

HUMAN CAPACITY DEVELOPMENT				
Emerging (Staff & PG Students)	4 Staff		P Ntalyatwa L Tekeni T Speckman V Mdunyelwa	
Established Researchers	4 Staff 4 HEAVA			
ACADEMIC ENGAGEMENT				
GRANTS RECEIVED				
KNOWLEDGE PRODUCTS				
Intellectual Property				
IP Commercialisation				
Disclosures				
OTHER (Specify)				