> This presentation is to apprise about the activities and achievements of the Faculty Development Centre in Cyber Security and Data Sciences established at Shivaji University, Kolhapur

- ☐ Date of approval by PAB: 11th PAB: 17/06/ 2018
- ☐ Date of sanction of the project: 13/09/2018
- ☐ Date of Commencement of Implementation: 26/11/2018

Professor R.K. Kamat
Coordinator
MHRD PMMNMTT FDC
Cyber security & Data Science,
Shivaji University,
Kolhapur

Cyber security : Quotable Quotes…

The only system which is truly secure is one which is switched off and unplugged, locked in a titanium safe, buried in a concrete bunker, and is surrounded by nerve gas and very highly paid armed guards. Even then, I wouldn't stake my life on it.

Professor Gene Spafford

Director, Computer Operations, Audit and Security Technology

(COAST),   Purdue University

Established 57 years ago

Graded 'A' by NAAC

Charting out new frontiers in Materials Science, Engineering and Technology And the like

Faculty Development Centre in Cyber Security and Data Sciences

Yet another exploration into a fascinating world – delving into the digital future

Helping Shivaji University to achieve a place of eminence in higher learning

——— Courtesy ———

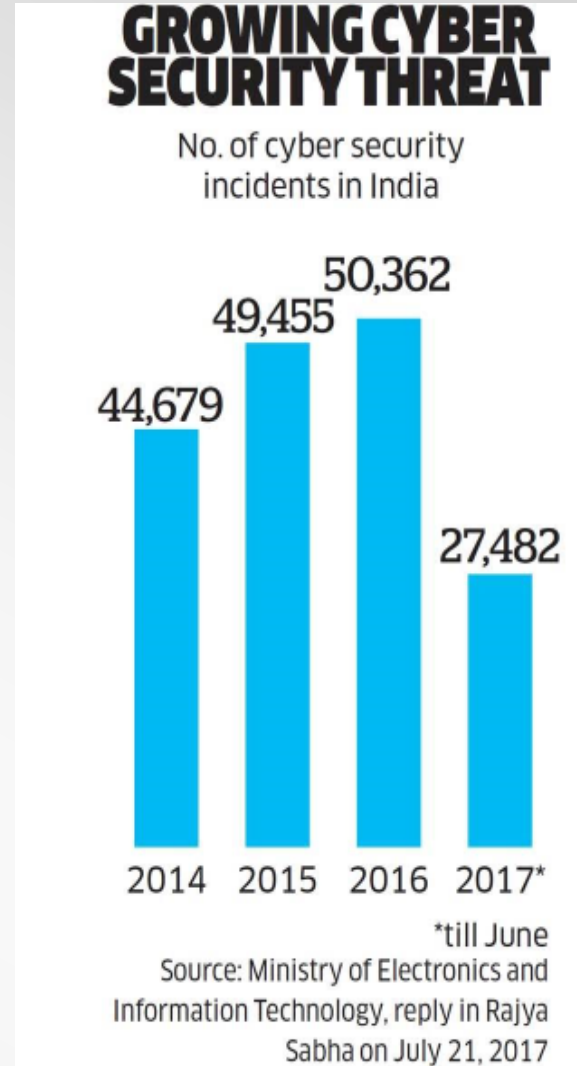|		
MHRD सत्यमेव जयते Ministry of Human Resource Development	Rashtriya Uchchatar Shiksha Abhiyan (RUSA),	**NASSCOM** National Association of Software and Service Companies (NASSCOM)
Vice Chancellor, **Prof. (Dr). Devanand Shinde**	Pro Vice Chancellor, **Prof. (Dr.) D.T. Shirke**	Importantly the committed Group of Government Secretaries and others Officials of departments, institutions and organizations

Genesis of the Centre: Why Cyber Security?

- Companies and enterprises in India are nowadays quite vulnerable towards growing cyber attacks

- India's digital dream could be held to ransom by the dark web

- Growing threats to National Security (26/11)

- Increasing threats to online services (Cosmos Bank)

- Exponential growth in social networking sites, social engineering- the easiest & quickest way to commit ID theft

GROWING CYBER SECURITY THREAT

No. of cyber security incidents in India

50,362

49,455

44,679

27,482

2014 2015 2016 2017*

*till June

Source: Ministry of Electronics and Information Technology, reply in Rajya Sabha on July 21, 2017

Cyber Security: Job Potential

Job Opening

Growth in demand for cybersecurity professionals (tech and non-tech) is more than 3x the growth in supply

GROWTH OVER LAST 12 MONTHS

29.50% JOBS

9% Professionals

Bulk of the demand is triggered by tech, BFSI sectors

SPREAD OF DEMAND ACROSS INDUSTRIES

Technology	(%)
Technology	58
ITeS	25
Software product	24
Security cos	9
BFSI	35
Others	7

Digital Drive

Salaries of top cybersecurity talent have risen 25-35% over the last one-and-a-half years

Hacking, cyberattacks are compelling firms to hire talent at high compensations of ₹2-4cr

Moves like demonetisation, Digital India drive have further pushed the demand for cybersecurity talent

In some cases cybersecurity leaders are reporting directly to their company boards

Our objective is to enhance employability of the students through Train the Teacher (TTT) Model

Source: Economic Times

Cyber Security: Job Scenario

The Hot Seat in Cyber Space

CYBER SECURITY PROFESSIONALS' SALARIES

Entry level
₹3,00,000-350,000 annually

Mid level ethical hacker
₹5,70,000

Senior level, Chief Information Security Officer
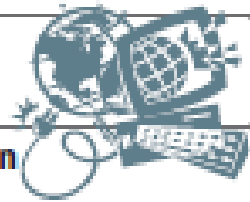₹1.2 million - ₹8 million annually

Highest paying Industry Telecom/Internet service providers ₹1.17 million annually	Second highest paying Industry Banking/financial services ₹1.05 million annually

TOP TWO CITIES IN INDIA

NCR ₹8,60,000 per annum	Bengaluru ₹8,44,000 per annum

REALITY CHECK

Experience (years)	Average salary* per annum (in ₹ lakhs)	
0-2	2.85	
2-5	4.01	
5-10	7.43	
10-15	13.40	
15-20	19.80	
>20	24.74	

Source: Business Standard

Cyber Security Job Opportunities
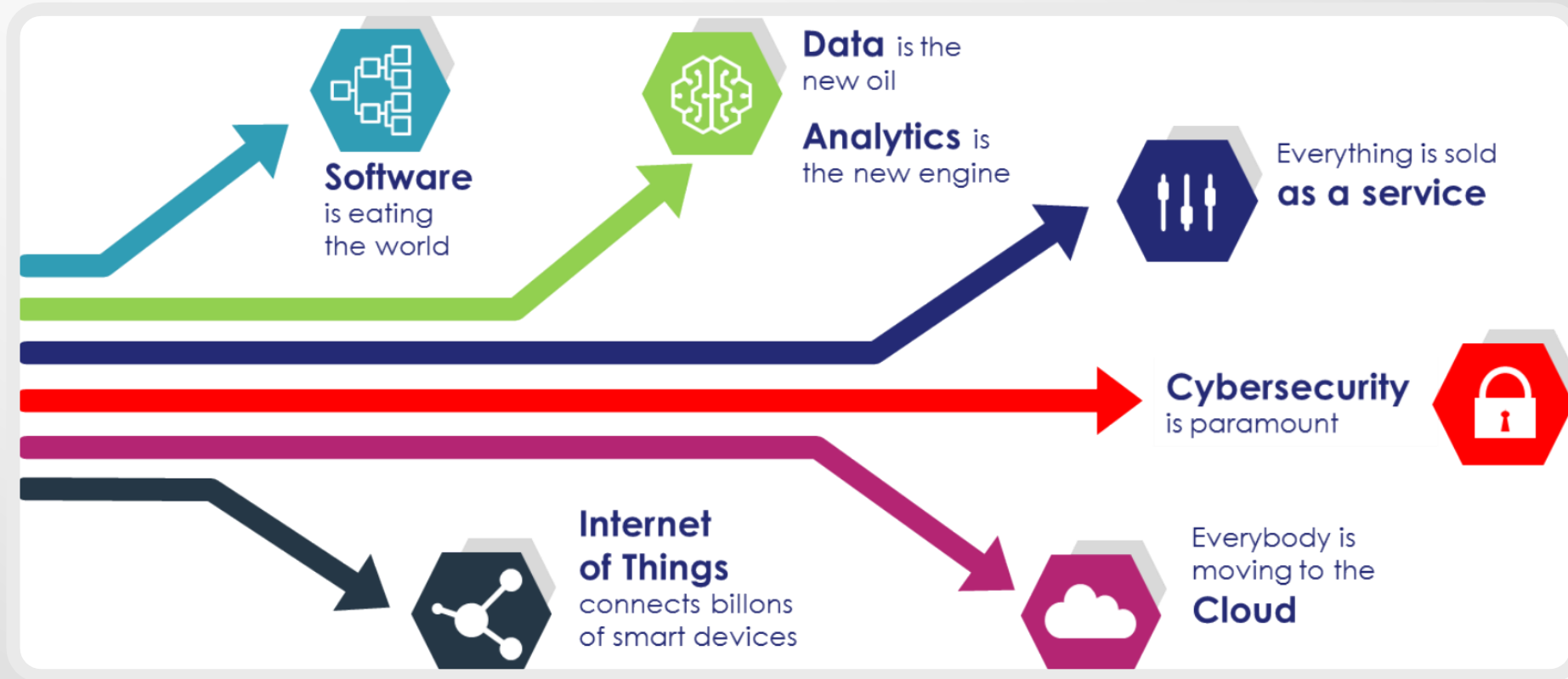
Why we connect Cyber security to Data Sciences
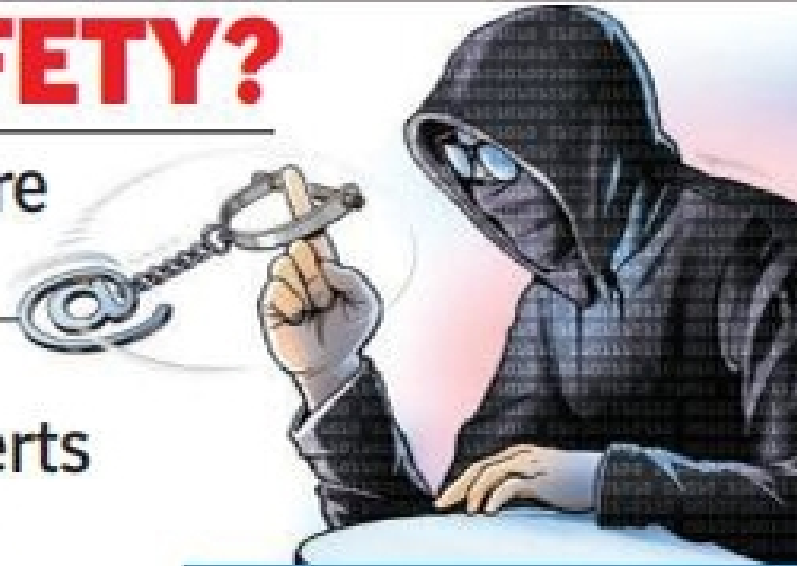
Source: Times of India
Dt. 20-03-2018

Funding Under
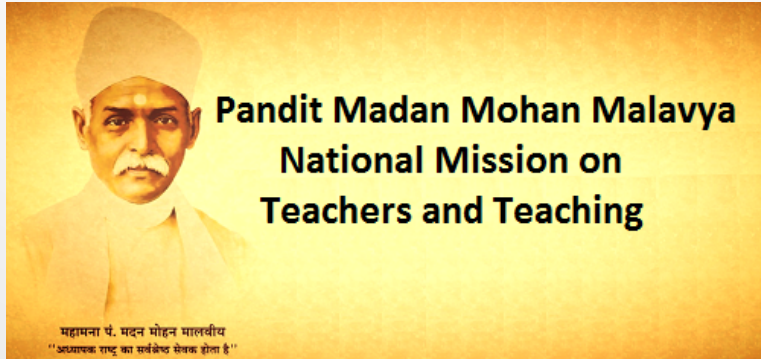
**Pandit Madan Mohan Malviya National
Mission for Teachers and Training
for
Cyber Security and Data Sciences**

As per the approved proposal funds are deployed in

Training of teachers in Cyber Security
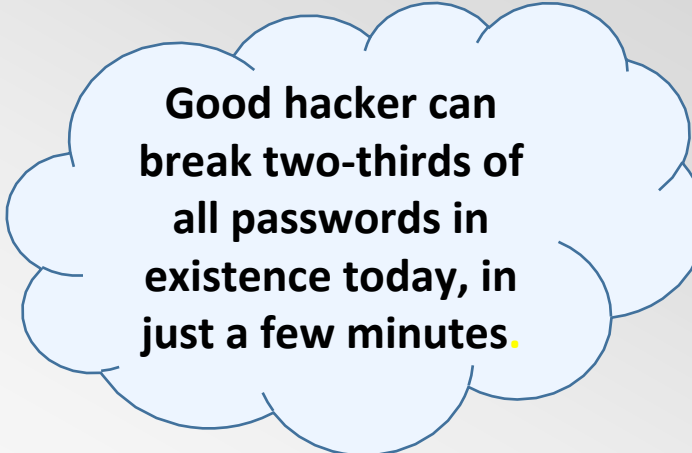

Establishment of state-of-art Cyber Security Lab

Setting up an advanced Lab for Data Sciences

Building of the Centre

Teaching Methodology: We start with brainstorming on issues such as

- You have five email accounts & all of them have same password

- You select remember option for your facebook, instagram

- Your password is your birthdate, mother's name or ….

- You charge your mobile at a mall having public charging utility

- You seriously look at emotional messages crafted to appeal to your sense of fear, urgency, enthusiasm, horoscope seriously.

- You have Universal & Stagnant Passwords

- You do not pay much attention towards your wards playing games like Pokémon Go

- You update your apps such as whatsapp less frequently ignoring the improtance of end to end encryption

Good hacker can break two-thirds of all passwords in existence today, in just a few minutes.

Achievement: Training Multidisciplinary Pool of Faculty Members because…
it Isn't Just IT… Applications in every domain

Agriculture, Food & Natural Resources	Health Sciences
Architecture & Construction; Manufacturing	Hospitality & Tourism; Marketing
Arts, A/V Technology & Communications	Human Services
Business Management & Administration	Information Technology
Education & Training	Law, Public Safety, Corrections & Security
Finance	Science, Technology, Engineering & Mathematics
Government & Public Administration	Transportation, Distribution & Logistics

Cyber security skills gap in every sector

CYBERSECURITY THREATS ON THE RISE

781 U.S. REPORTED DATA BREACHES IN 2015 | **SECOND** HIGHEST YEAR ON RECORD[1]

INDUSTRIES IMPACTED

#1: BUSINESS NEARLY **40%**

#2: HEALTH/MEDICAL **35.5%** +

#5: EDUCATION **7.4%**

#3: BANKING/CREDIT/- FINANCIAL **9.1%**

#4: GOVERNMENT/ MILITARY **8.1%**

THE TOTAL AVERAGE COST OF A DATA BREACH

IS NOW **40 Lakh**

up from *38 lakh 2015*

Issues pertaining to jurisdiction and global soft skills

Course Curricula: for FDCs as well as those introduced at various levels for students to be trained under TTT model

- Cyber security Courses for Engineering Faculty :
  - SSC/Q0903: Analyst Application Security
  - SSC/Q0917: Consultant Network Security
- Cyber Security for all other faculties
- Incorporation all courses at appropriate level in academia
  - ENTRY LEVEL   (B.A./B.Sc./B.Com. 1st Year)
  - INTERMEDIATE LEVEL (B.A./B.Sc./B.Com. 2nd Year)
  - EXPERT LEVEL (B.A./B.Sc./B.Com. 3rd Year)
- All Courses with four credits i.e. 60 hrs including hands on

Our achievements so far

4000 + teachers trained in **1 year through near about 100 Faculty Development Programs**.

- Lab for Data Sciences started functioning

- State-of-art Cyber Security Lab commissioned

- Resource Material with appealing sense of readability in place

- Virtual Laboratory Kit for upgradation and revision

- Building work started, deadline set is March 31, 2020

Resource Material Developed

❑ **Reference Book: Flip the Classroom: Bloom's Taxonomy to MOOCs... A Pragmatic Approach, Himalaya Publications**

❑ **Reference Book: Data Analytics in R: A Case Study based Approach, Himalaya Publications**

❑ **Text Book: A Special Edition Text Book on Cyber security**

❑ **Text Book: Online Self Defence Technique for Women**

❑ **Lab Manual: Online Self Defence Technique for Women**

❑ **Text Book: A Special Edition Text Book Awareness in Cyber security**

❑ **Reading Material on: Resources in Cyber security**

Resource Material under development is as follows:

❑ **Reference Book: Data Exploration and Visualization in R: A Practical Guide**

❑ **Reference Book: Decision Making through Data Science: from Concepts to Applications**

❑ **Reference Book: Artificial Intelligence based Personalized Learning Model: Revitalizing Education**

❑ **Development of Open Educational Resources (OER) for Data Science... Case Study based Approach**

❑ **MOOC on Data Science**

❑ **Development of MOOC for Capacity Building of School Teachers in Techno-Pedagogy**

ABOUT THE AUTHORS

Dr. R.S. Kamath is Associate Professor in the Department of Computer Studies, Chhatrapati Shahu Institute of Business Education and Research, Kolhapur, India. She obtained her Bachelors and Masters in Computer Science from Mangalore University. She received her Ph.D. in Computer Science specialized in Computer Based Visualization from Shivaji University and completed the same in 2011. Dr. Kamath has to her credit 30 research papers published in reputed national and international journals and presented 11 papers in national conferences. She has completed two minor research funded by UGC. She is the author of three books and many book chapters including the ones in Encyclopedia of Information Science and Technology by IGI Global Publishing. Her areas of research interests are Artificial Intelligence, Virtual Reality, Soft Computing and Data Mining. She has keen interest in ICT based pedagogy and has been instrumental in realizing experiential teaching-learning in classroom environment with many apex institutes such as IIT Bombay.
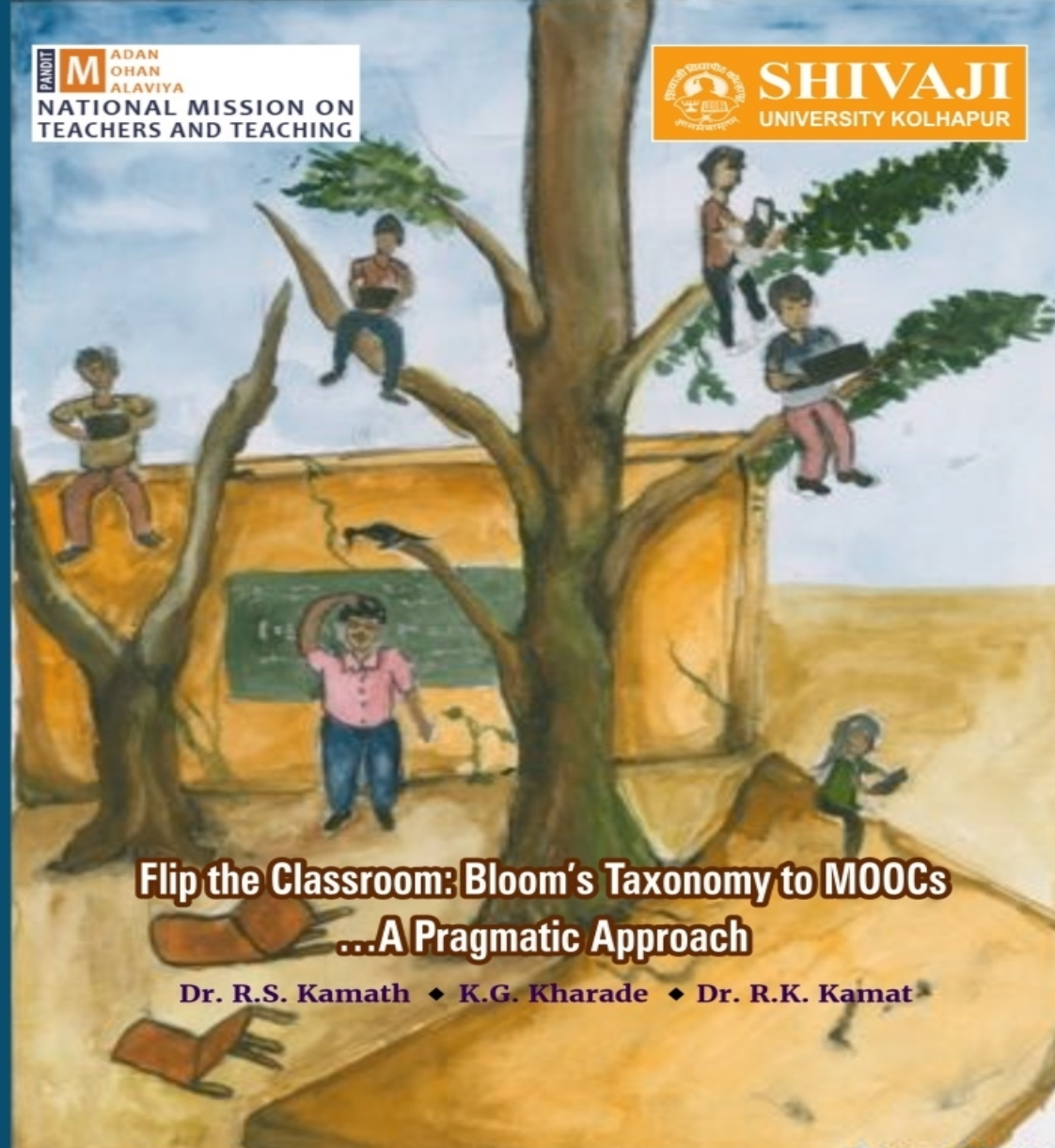
Kabir G. Kharade is a faculty at Department of Computer Science at Shivaji University, Kolhapur. He has recently worked on an interesting interdisciplinary research on predicative modeling for materials synthesis leading to devices such as temperature sensors and solar cells as a part of his Ph.D. He is an avid user of latest technology in the domain of web designing, app development and as a passionate techie implemented good number of projects in these domains and published them widely in the scholarly literature.

Dr. R.K. Kamat is currently Professor in Electronics and heading the Department of Computer Science at Shivaji University, Kolhapur. He is an accomplished University faculty with 25 years of rich teaching and research experience. He is also holding the positions of Director of Innovation, Incubation and Linkages and Director, Internal Quality Assurance Cell at Shivaji University, Kolhapur. Dr. Kamat has to his credit 125+ publications in journals from reputed publishing houses such as IEEE, Elsevier, Springer in addition to 12 reference books from reputed international publishers such as Springer, UK and River Publishers, Netherlands. The books have been placed in more than 400 Libraries all over the globe. He has successfully guided 16 Ph.D. students. He has mobilized research grants to the tune of Rs. 24 Cr. from different funding agencies such as UGC, DST and MHRD. He is a Young Scientist awardee of DST under Fast Track Scheme. Dr. Kamat with his colleagues established the first of its kind fiber optics based internet backbone at Goa University and contributed immensely for the satellite based centre for Distance Education to implement the 'Panchayat Raj' program of Goa Government. He has also worked as a Consultant for the 'Indian Navy' and 'National Centre for Antarctic and Ocean Research'. He has been working on different committees of UGC such as LOCF, Autonomy of HEIs, CPE and also expert evaluator of NAAC, Bengaluru. His latest initiatives are setting up FDC under MHRD PMMMNMTT in Cyber security and Data Sciences, RUSA-Industry sponsored Centre of Excellence in VLSI System Design and coordination of two international projects EQUAMBI and Internationalized Master Degree Education in Nano Electronics under the EU's Erasmus+ scheme.

Cover page artwork designed by: Tejas Uthale

PANDIT MADAN MOHAN MALAVIYA NATIONAL MISSION ON TEACHERS AND TEACHING

SHIVAJI UNIVERSITY KOLHAPUR

Flip the Classroom: Bloom's Taxonomy to MOOCs ...A Pragmatic Approach

Dr. R.S. Kamath ◆ K.G. Kharade ◆ Dr. R.K. Kamat

Appreciation:

राष्ट्रीय प्रौद्योगिकी संस्थान सिलचर
National Institute of Technology Silchar
(राष्ट्रीय महत्व का संस्थान)
(An Institute of National Importance)
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फैक्स/Fax : (03842) 224797	ई पी ए बी एक्स/EPABX : 233841 - 5100/5101		
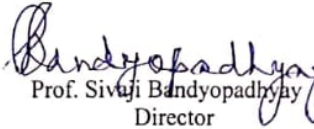
Date: 22/10/2019

To Whom It May Concern

This is to apprise that Shivaji University, Kolhapur has conducted Faculty Development Programme on **Cyber Security** during 14-19, October 2019 at National Institute of Technology Silchar, Assam for faculty members. The course content was effectively designed to provide maximum knowledge to the participants. The training was conducted under PMMMNMTT scheme of MHRD. Faculty members gained immensely from the workshop. We are hopeful that the knowledge gained will be further communicated to the students to help them understand the threats of the digital world.

The trainers were certified by NASSCOM and did an excellent job while imparting practical training to the participants. We appreciate their efficiency and expect to conduct more such workshops for our faculties in the coming days.

Thanking you.

Prof. Sivaji Bandyopadhyay
Director
NIT Silchar
निदेशक
Director
राष्ट्रीय प्रौद्योगिकी संस्थान, सिलचर
National Institute of Technology. Silchar

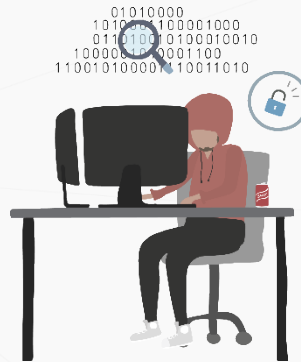**Appreciation: MHRD hosted the snapshot of virtual laboratory kit on twitter handle**
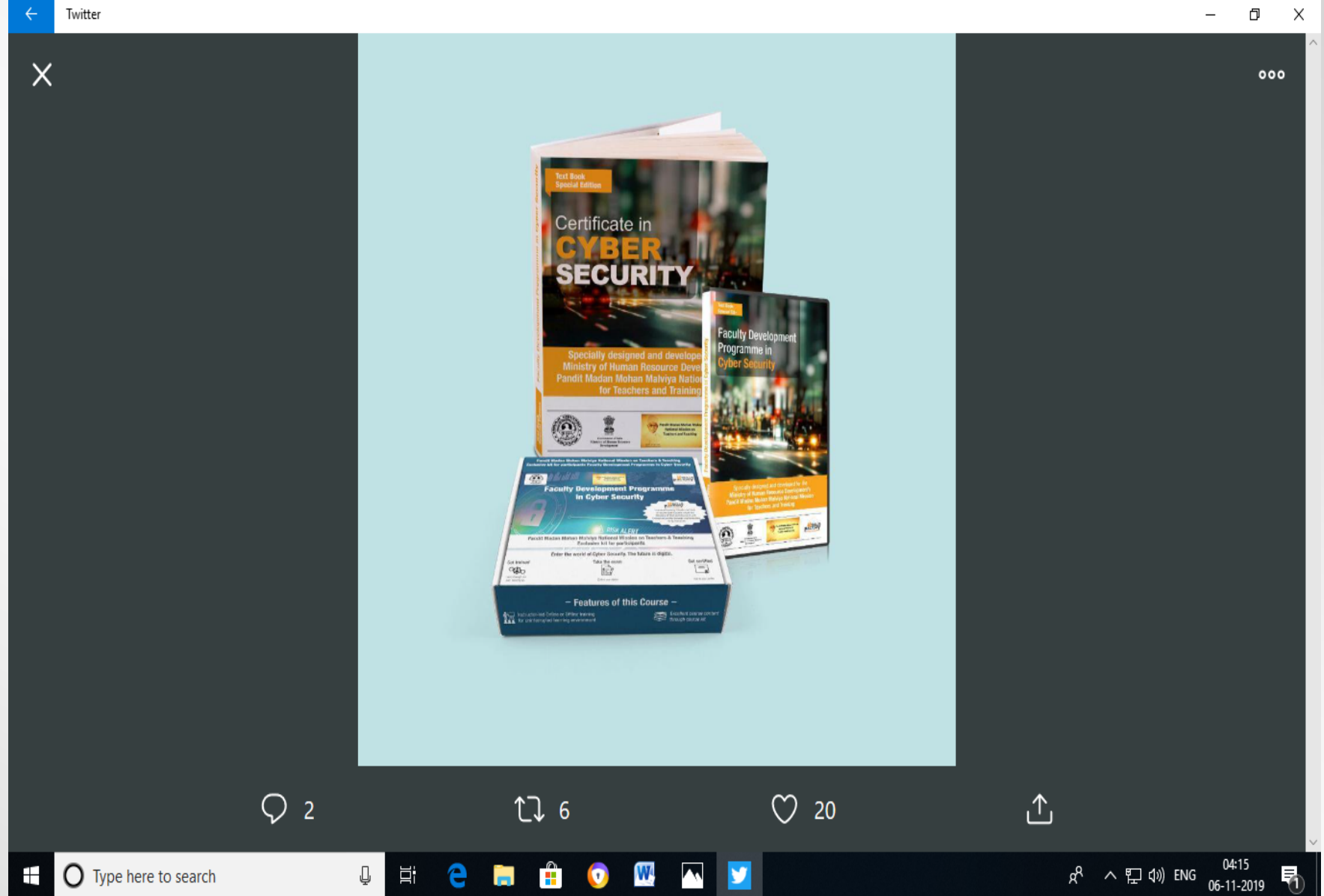
Shivaji University, Kolhapur in South-West Maharashtra
Through RUSA support we are gearing towards 'Multiplier' effect
For nurturing HR in this niche domain
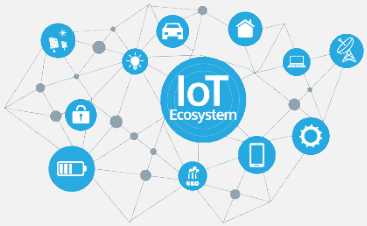

Catering to **6 lakh** students today

To be made **6 lakh** cyber security conscious students by academic year end **2020**
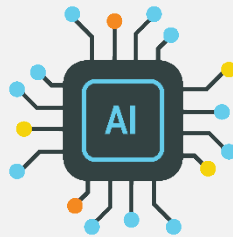

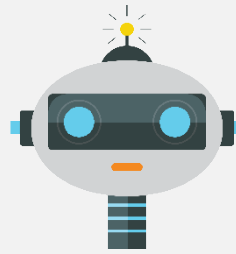Idea is to motivate at least **60,000 students take up careers in digital security**

Cyber security evolving into digital security because everything is going digital –
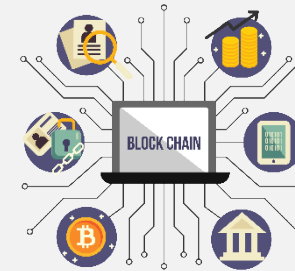
IoT

AI

Robotics

Blockchain

Cloud etc.

Digital technology touching every facet of life, every aspect of existence

- **Connected devices**

- **Communication devices**

- **Smart cities** (not smart unless you adopt attendant security measures!)

- **Mountainous Government databases**

- **All financial transactions**

- **Tele-medicine**

- **Educational systems** – multiple digital interactive modes of content delivery

- **E-commerce**

An infinite list

Yet needing a finite solution for its very survival

Digital Security

Notice we started with Cyber Security and now transforming it into Digital Security
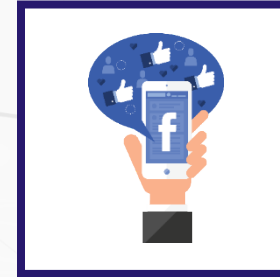
The magnitude of the need for digital security

1.1 Billion Telephone Subscribers
(2nd largest in world)

1.15 Billion Digital IDs
(Largest national ID programme)

463 Million Internet Users
(2nd largest in the world)

241 Million Facebook Users
(Social media penetration)

....just a small part. But they equally need digital security

India needs

- **10 lakhs** cyber security experts.

- **1,000** cyber security product-based start-ups in the next 8 years.

Today we have only **62,000 cyber security professionals**.

And so we need to add every month 10,000 such professionals if we have to ensure a certain level of security.

& our FDC is committed to bridge this demand – supply gap

Opportunities exist for students

Centre for Cyber Security & Data Sciences at Shivaji University is working on these challenges.

- Cyber Experts needed globally by end 2019 – **60 lakhs**

- Cyber Experts needed in India by 2025 – **10 lakhs**

- Better employment opportunity for Cyber Security trained students

- Cyber smart employee – Need of the hour

*NASSCOM FORECAST (2015)

NASSCOM

For synergies in approach, seamless thought process and perceptible capability, we are working in partnership with SSC certified industries, NASSCOM, RUSA and a partnership with DRDO is in pipeline

This will ensure the quickest possible way to complete the target we have in hand.

We at Shivaji University are grateful to MHRD for reposing faith in us to start the PMMMNMTT Faculty Development Centre in Cyber Security & Data Sciences. Besides it being an educational and skill-building project, it has national repercussions of safety and security.

We are proud to be associated with this noble objective.