On automation of university processes and services: a systems approach

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Background

- Thankful to the Dean for resuscitating this. Heard of days of yore when the Awojobis & co. used to present stimulating ideas.

- The organizers require that I present a non-copyrighted work report, relevant to engineering training and this community.

- When asked about his overall effort and legacy at the Convocation Press Conference on Jan 18, the VC said his administration is working towards putting 'UNILAG on autopilot'
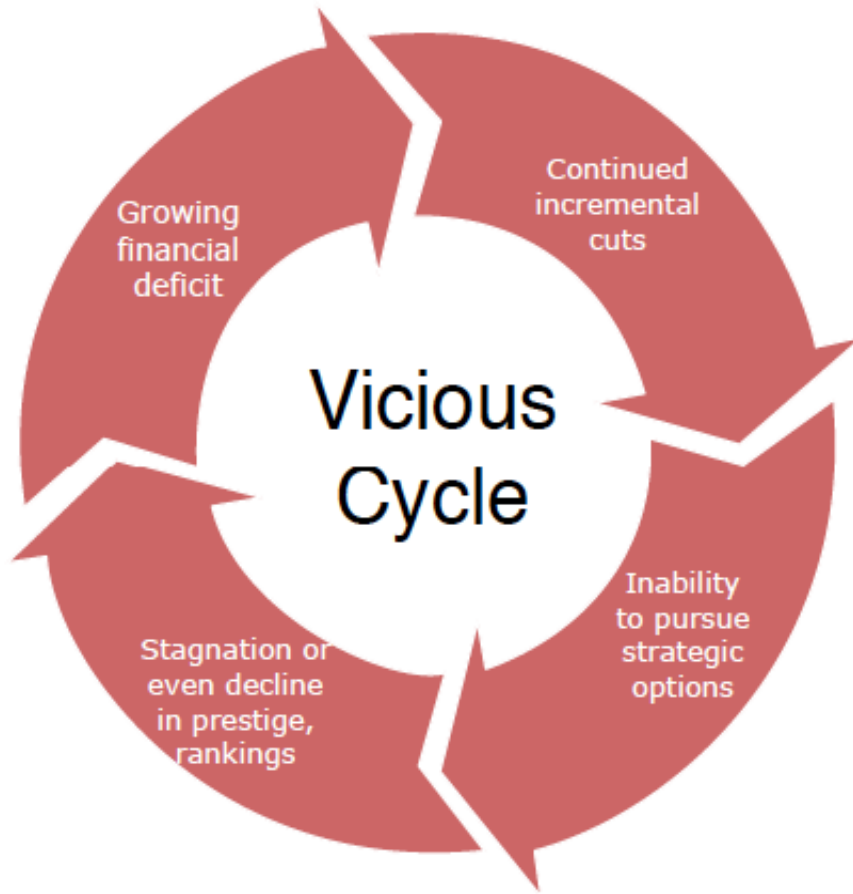
- Today marks the beginning of a much needed revival. Academics and departments are being put on the spot to explain their contributions in problem-solving as engineers.

- Presentation is substantially yet to be published research efforts of my former/current students and I.

- An opportunity to advise the university on how to better attain the "autopilot" aim of our VC, (apposite to realizing the institutional vision and mission statements).

Keywords Definition
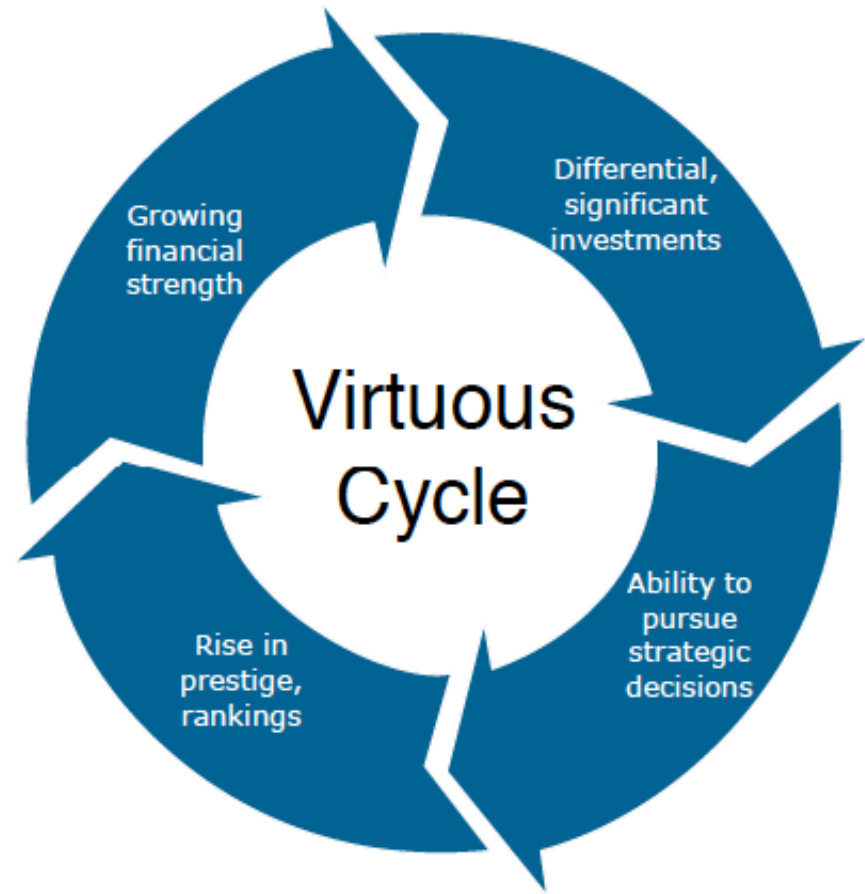
- Automation: the use of electro-mechanical equipment and computing to control and perform functions with minimal or no human intervention.

- University processes and services: procedures and activities to <u>create, administer and support</u> the core mandate of teaching, learning, research in a tertiary institution such as UNILAG.

- Systems Approach: holistic, carefully designed and integrated paradigm (rooted in the principles and/or skills of Systems Engineering).

Introduction

- The overall well being and development of a nation somehow depends on the breadth and the depth of its educational programs especially at the primary and tertiary levels, respectively.

- Despite the present economic challenges, in this ICT-driven age, it is imperative to embark on automation so as to ultimately decrease the amount of time spent on back-office activities and reduce operating expenses, human drudgery/ biases/ inefficiencies in order to advance an institution.

Source: Jason Grunin, University of Tulsa

Automation Transforms Jobs; modifies low level & middle tier jobs; behind success of Konga, Jumia, Uber, AirBnB, Alibaba, Facebook, Google, etc.

- Around 2003, initial UNILAG website was build by two products of this engineering faculty who maintained it until…

- Towards the end of the last decade, the popular Blackboard™ educational system was temporarily acquired but not fully deployed because…

- The current **Premier**™ system by a *Consultant* could be improved in design and usage…

Late 2015, we conducted a research survey to ascertain the level of automation and e-administration in six universities in the South-West region of Nigeria; namely **UNILAG, LASU, CU, FUNAAB, UI & LAUTECH**. Interviews and Questionnaires were administered on stakeholders (teaching/non-teaching staff, students and others) to gauge their awareness/usage of ICT facilities on campus. We sought to ascertain whether related benchmarks by NUC were also met. The results indicate that:

- Automation indices were generally average
- Funding for equipment acquisition remains a constraint, alongside electricity provision and reorientation of people to adapt to changes.

The UNILAG Experience

- UNILAG as "*the university of first choice and the nation's pride,*" must pursue *e-everything* such that the various components of the institution are ICT-compliant and integrated, with their seamless interaction assured for optimal performance.

- *Systems thinking and expertise* are indispensable to achieving effective results. Around 2003, the Prof. Abass led Committee (wherein Prof. Mowete, I and 4 others were members) recommended the transformation of the former Computer Center into the present Center for Information Technology and Systems (CITS).

Some services amenable to automation

- Library: user-registration, cataloging, searching, borrowing, late-returnee detection/fines

- Medical: student|staff registration, appointments, e-consultations, notification of test results, pharmacy inventory/dispensing management, etc.

- Guesthouse: remote booking, store management

- Bookshop: catalogue, ordering & pick-up especially at beginning of a school term/semester

- Parking: allotment of vehicles to spaces possibly with e-tags

- Fire-detection/fighting, security surveillance, sports center or chapel booking/scheduling, etc.

Some processes amenable to automation

- Sale of Forms (for PG programs, Expression of Interest by Bidders, etc): via download or online-filling –after payment by Debit Card or Bank Transfer, etc.

- Student Admissions: we have developed a web module for candidate selection into undergraduate programs .

- Online Exams and Recruitment: Post-UTME, GST and Staff Recruitment Exams handled by CITS. Before online JAMB exams, we developed a system (www.andrewschallenge.net) that offers/deploys customizable online (multi-choice) exams for academics, scholarships, jobs, etc. Working on short answer/essay type online exams system.

- Student registration and Fees Payment (noting compulsory/elective courses, Lectures/Exams schedules), distant learning (via web-video, virtual experiments, results tracking, intra-faculty transfers, transcript generation, clearance processing and ticketing for convocation.

- Student accommodation & Staff housing allocation.

- Access control and e-Attendance taking at Lectures/Meetings.

- e-Voting at Senate, Congregation, etc.

- e-Memos via digitally signed copies being delivered via intranet or e-mail.

- e-Budgeting and tracking by departments/mgt.

Areas to immediately improve in current platform

- Auto re-activate students who have completed a Deferment, LOA or Rustication based on Senate approval to proceed or return.

- Fetch/utilize information in student or staff profile (+online APER Form) rather than incessant Memo requests for same. Retraining of relevant HRMB staff on configuring of recruitment portal.

- Tracking of combination of Electives Courses required for various options within a program against total graduating units.

- Configure academic publications section of the repository to display only the acceptable ones.

Recommendations

- Use employees at CITS to <u>design, code, test, deploy and maintain our web applications</u> –with experts from departments such as Systems / Computer Engineering, Computer Science, Physics, Mathematics, Educational Technology, Accounting etc. as *Consultants*.

- Utilize Open Source Systems such as Linux OS, Open Office, PHP, JavaScript and MySQL database systems to reduce total cost of ownership and ensure we can rapidly customize and also contribute to the enhancement of these tools.

- <u>I</u>nvest and develop to the extent of becoming an innovation, outsourcing and data center.

Thank you & God bless

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