

**Technology-driven innovation: knowledge  
management for technopreneurial skills  
development in institutions of Higher learning  
in Harare**

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# INTRODUCTION



# Knowledge society today

- The knowledge society demands technology-driven innovation in knowledge management
- The term refers to any society where knowledge is the primary production resource instead of capital and labour
- Knowledge and innovation serve as strategic and transforming resources of society, just as capital and labour have been in the earlier industrial society

## Knowledge society today ( Cont.)

- Drucker points out that the knowledge society is one in which the quality of life is dependant upon the primary production of knowledge as a resource instead of capital and labour.
  - A knowledge society is a society that creates, shares and uses knowledge for the prosperity and well-being of its people.
- “...new wealth is neither money nor power but information and knowledge....”




# Importance of KM in HE Institutions

- Better decision making capabilities,
- Reduced product development lifecycle (curriculum development and research)
- Improved academic and administrative services
- Reduced costs.



# Challenges of KM in HE institutions

- Rapid changes in technology,
  - Competition for funding for research and development,
  - Globalisation
  - Standardisation
  - Lack of knowledge management appreciation culture
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(Cont.)

- Lack of proper systems & mechanisms to harness tacit & explicit knowledge
- Inability to measure financial benefits of KM
- Organisation processes not designed for KM



# KM as a tool for sustainable dvpt

- Knowledge and Innovation serve as the strategic and transformational resources of society ,just as capital and labour have been in earlier industrial societies
- KM can provide suitable solutions to the storage and communication of information and knowledge.
- KM is useful as it helps to tackle complex issues and product/process development.

- Issues of knowledge development are also issues of technological development and the effective use of technology.
- KM technology can contribute significantly to the evolution and application of knowledge for implementing strategies and practices that are more educationally and culturally sustainable.
- Disparity between first world and third world countries in their capacities to generate and harness knowledge in the pursuit of sustainable development and improved living standards.  
(World Bank Report 2002)

# **HISTORICAL BACKGROUND OF THE CONCEPT**



## KM Concept

- KM has been with us since time immemorial as human beings grappled to control nature rather than live at its mercy.
- Traditional societies relied on living repositories of distilled experiences in the form of the elders, the traditional healers, midwives and griots who helped to sustain the culture.
- Tacit knowledge has always been highly prioritised as an instrument for education and social development in traditional societies.

(Cont.)

- Progressive societies have relied on narrative repositories as people found ways to share knowledge in order to build on earlier experiences, eliminating costly redundancies and preventing repetition of the same mistakes.
- Polyanyi notes that human beings have succeeded in balancing the equation in their favour by reducing the effect of natural events on their civilisation and maximising the impact of their civilisation for better or worse.



## Cont.

- Corporate organisations should be characterised by a learning culture, which enables individuals not only to learn from past experiences encapsulated in corporate memory systems but to also generate knowledge through technology-driven innovations.
- Technology has always been the driving force of development as confirmed by the transition from pre-industrial to the current post industrial age where information and knowledge have become critical sources of wealth.



- Technology is both an enabler and a driver of change because it provides creative possibilities with new opportunities driving change as well as providing solutions to challenging problems.



# KM Overview

## 3 Perspectives

### 1. Business perspective

- Knowledge can be viewed as a business activity whose main features is firstly to treat the knowledge components of business activities as an explicit concern of business reflected in strategy, policy and practice at all levels and secondly connecting the organisation's intellectual assets to positive business results
- - **Barclay & Murray**

# KM Overview

## 3 Perspectives (Cont.)

### 2. Cognitive Science Perspective

- This is a knowledge science perspective that defines knowledge as the insights, understandings and the practical know-how that all humans possess since knowledge is the critical factor that makes personal, organisational, and societal intelligent behaviour possible.

**-Wiig**



# KM Overview

## 3 Perspectives (Cont.)

### 3. Technological /process perspective

Defines knowledge management from a technological perspective as the systematic approach to manage the use of information as a way to provide a continuous flow of knowledge to the right people at the right time to enable creative inventions and the efficient decision-making in the day-to-day activities of business entities.

- Ward (et.al)



## KM Overview

### 3 Perspectives (Cont.)

- Business and technology perspective definitions of knowledge management imply that organisational knowledge is real and a strategic resource worth managing as it can make the difference between an organisation achieving or failing to realise its objectives.
- The three perspectives overall imply that human beings are an indispensable source of knowledge and are critical for knowledge management processes and innovation.

## Application of KM in HE institutions

- Higher education institutions have significant opportunities to apply Knowledge Management practices to support every component of their mission in this current dispensation of 'creagement'
  - The creation society is entirely concerned with the development of concepts for new technologies, products and systems so that individuals fully actualise their creative potentials...
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## Application of KM in HE institutions (Cont.)

- Higher education institutions will have to intensify their efforts towards research and development as a way to generate, coordinate promote and utilise new knowledge.
- HE institutions can convert the information /knowledge that resides individual staff members so that it can be easily and widely accessed for the benefit of all.
- Creating electronic portal/repositories of knowledge that can be useful to all

(Cont.)

- Nurakama and Nishiwaki defined 'creagement' as " ....the preparation of schemes and setups that would stimulate full exercise of creativity on the group and corporate levels by motivating individuals to fully actualise their creative potential ..."



# KM in HE Institutions: Harare Context



# Background

- The turbulent economic situation in Zimbabwe has adversely affected HE institution's capacity to generate new knowledge but overallly such unusual situations demand unusual solutions.
- When we view chaos from a dialectical context chaos can be turned into a welcome interlude for technological innovations.
- Institutions of Higher education have taken the initiative to create conditions for technological innovations despite the economic hardships.

# METHODOLOGY



- Survey approach.
- Questionnaires and interviews which were administered and conducted within the government technical institutions of Higher Education in Harare.
- The survey population included Heads of Faculties and lecturers responsible for various technopreneurial projects.
- Pilot testing of draft of the questionnaires and interview schedules in order to ensure sufficient reliability for distribution and administration.

## FINDINGS

- Harare Polytechnic's academic departments are involved in technology driven innovations and this is in line with the institution's vision of being "the leading center of excellence and choice in training and commercialization of technology, run along reputable business principles "



**INNOVATIVE  
TECHNOLOGY  
DRIVEN PROGRAMMES**



# INTEGRATED SCHOOL OUTREACH PROGRAMME (ISOP)

- Integrated School Outreach programme (ISOP) involves the development of mutually beneficial relationships between the college and the technologically disadvantaged people in the rural areas.



## INTEGRATED SCHOOL OUTREACH PROGRAMME (ISOP) (Cont.)

- Institution's various academic departments interact with rural target population to find out the required skills, design training programmes & deploy lecturer's in the rural areas to impart technopreneural skills to the rural populace
- Projects include bakery, construction, dressmaking, welding, entrepreneurship, records management.



## INTEGRATED SCHOOL OUTREACH PROGRAMME (ISOP) (Cont.)

- This programme helped to impart skills within the high-density areas within the proximity of the institution.
- The Harare Polytechnic continues to impart Zimbabweans and fellow Africans from as far as Mozambique with entrepreneurial and innovative skills exemplified by various appropriate and innovative technologies through ISOP

## INFORPRENEURSHIP

- The Information Science Department is also involved with National Archives of Zimbabwe in the compilation of the National Bibliography through the provision of consultancy work in the area of cataloguing, classification, indexing and abstracting.



# EFFICIENT DRIP IRRIGATION

- The Departments of Mechanical, Civil and Electrical Engineering are engaged in a collaborative project on efficient Drip Irrigation.
- Keller states that Drip irrigation as an innovation can be applied to rationalize water use at the same time improving food productivity through assisting areas of low rainfall.



# Drip Irrigation Equipment



## SHORT COURSES

- Provides short courses to students in the areas of information technology, cosmetology, cookery, business management, motor mechanics, electrical and mechanical engineering among others.
- courses provide students with technopreneural skills that will enable the graduands to set up small scale businesses and be self employed.

# SCHOOL OF INVENTORS

- This is a research unit, which is open to anyone in the community who is innovative or inventive.
- Unlike the conventional schools the school of inventors is open to anyone regardless of their educational qualifications.
- The main idea is to attract talented and gifted students with capacity for innovations.



# Electric Solar Panel



# MASS COMMUNICATION

- This school set up a radio station that broadcasts within the college.

Opportunity to be engaged in practical broadcasting work.

- Experience before graduation to the corporate world

Some students now involved in consultancy work as well as commercial ventures like the production of videos and films.





# SCIENCE AND TECHNOLOGY

- Department collaborated with industry and government to research on alternative sources of energy in the form of biodiesel project
- Done as a response to the country's energy crisis.
- Collaboration of different stakeholders and the synchronization of a chain of processes
- Technology driven project helped to provide the foundation for the development of bio-fuels as an alternative source of energy

# DEPARTMENTAL RUN BUSINESSES (D.R.B's)

- Forging symbiotic relationships with both private public and quasi governmental sectors.
- Each Department operates a Departmental Run Business that is headed by a production manager from among the lecturer's.
- Each department generates money that is accounted for and shared between the College and the lecturer's and students involved.

# OTHER INSTITUTIONAL PROJECTS

- Projects include the rural bathing geyser that uses coal heating, diesel making from steam of heat-charcoal, tobacco seed germinator, soya products like milk, yogurt and ice-cream.
- Products like the soya products to be patented and become intellectual assets.
- Will undergo technological incubation, i.e. testing and simulation to ensure that the ultimate product will conform to standards before commercialization.

# RECOMMENDATIONS

- The institutions of Higher Learning should ensure that an entrepreneurial culture with consequent entrepreneurial undertakings would remain as enduring feature of these institutions.
- The creation of Learning Organizations in Higher Education Institutions should be used as an innovative strategy to apply Knowledge Management to Higher Education.



## RECOMMENDATIONS CONT

- Develop management practices and systems that will facilitate the sharing or transfer of knowledge on appropriate technology driven innovations especially those that have a tacit knowledge dimension.
- The institutions of higher learning should create knowledge-based systems that facilitate the sharing of knowledge as well as bridging the gap between faculties or departments so as to promote inter-departmental collaborations.



## RECOMMENDATIONS Cont.

- Reward should be given not only for the generation of new knowledge but also for creating the mechanism for sharing that valuable knowledge, for example, complements, praises, awards, opportunities for external visibility and recognition including monetary gains.
- There should be prioritization of Knowledge management activities at policy and strategy decision levels.



## RECOMMENDATIONS Cont.

- Institutions should develop smart partnerships with industry and commerce that seek to stimulate collaborative research as well as transfer of technology. The outcome of these synergies should preferably produce tangible products and services.



## RECOMMENDATIONS Cont

- HE institutions should build a strong organizational, cultural and incentive-driven system that will effectively encourage researcher participation and input in knowledge generation and sharing.
- ICTs should be harnessed to build knowledge repositories and these should preferably be open-access. Tools such as Web 2.0/ Library 2.0 can be employed so as to involve researchers and curators in content generation and management.



## RECOMMENDATIONS CONT.

- HE institutions should develop management practices that will facilitate the transfer of knowledge across the organisation with special emphasis on tacit knowledge that is very complex to capture



## CONCLUSION

1. HE institutions should continue to invest more in knowledge generation and management particularly in the area of appropriate technologies as these have a direct bearing on sustainable development of Africa.
2. It is crucial for Africa to define its own knowledge that is consistent with its own circumstances rather having prescriptions from other countries being imposed under the guise of appropriate technology innovations.

## CONCLUSION Cont.

- HE institutions should prioritise knowledge management and be guided by clear appropriate policy initiatives to enable them to integrate formal and non-formal education as well as incorporate the education systems within the knowledge creation, coordination and promotion process.



Thank You!!!

