



African Virtual University

Applied Computer Science: ITI 2101

TECHNOLOGY INNOVATION

Hannah Orwa Bula

Foreword

The African Virtual University (AVU) is proud to participate in increasing access to education in African countries through the production of quality learning materials. We are also proud to contribute to global knowledge as our Open Educational Resources are mostly accessed from outside the African continent.

This module was developed as part of a diploma and degree program in Applied Computer Science, in collaboration with 18 African partner institutions from 16 countries. A total of 156 modules were developed or translated to ensure availability in English, French and Portuguese. These modules have also been made available as open education resources (OER) on oer.avu.org.

On behalf of the African Virtual University and our patron, our partner institutions, the African Development Bank, I invite you to use this module in your institution, for your own education, to share it as widely as possible and to participate actively in the AVU communities of practice of your interest. We are committed to be on the frontline of developing and sharing Open Educational Resources.

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Table of Contents

Foreword	2
Production Credits	3
Copyright Notice	4
Course Overview	10
Prerequisite Course or Knowledge	11
Materials	11
Course Goals	11
Units	12
Assessment	13
Schedule	13
Readings and Other Resources	15
Unit 0: Technology Innovation	18
Introduction	18
Unit Objectives	18
Activity 1. Diagnosis	18
SWOT analysis:	19
Key Terms	19
The role of the entrepreneur as an innovator	20
Activity 3. Entrepreneurial principles applied to technological innovation.	21
Entrepreneurial Principles	21
Importance of entrepreneurship	21
Summary	21
Unit Assessment	22
Evaluation	22
Unit Readings and Other Resources	23
Unit 1. Introduction To Technology Innovation	24
Introduction	24
Benefits of innovation	24

Unit Objectives	25
Key Terms.	25
Technological innovation:	26
Importance of technological innovation:	26
Corporate innovation strategies:	26
Learning Activities	26
Activity 1.1 - Introduction to Innovation	26
Activity 1.2 - Innovation sources	27
Research and development (R & D) and marketing sector.	27
Conclusion	29
Introduction	29
Conclusion	29
Evaluation	29
Activity 1.3 - Innovation Models	30
Introduction	30
The Cyclic Innovation Model	30
Evaluation	30
Technology hype curve model	31
Technology hype curve has the following stages :	31
Conclusion	32
Evaluation	33
Unit Summary	33
Unit Assessment.	34
Evaluation (Continuous Assessment Test)	34
Unit Readings and Other Resources	35
Unit 2. Innovation Indicators	36
Introduction	36
Unit Objectives	36
Key Terms.	36
Activity 2.1 - innovation indicators.	37

Importance of indicators:	37
Indicators rating:	37
Balanced Score Card(BSC):	38
Learning and growth perspective	40
Composite indicator:	41
Activity 2.2 - Global Innovation Index:	41
Learning activities	42
Activity 2.3 - Innovation Indicators.	42
Introduction	42
Evaluation	42
Activity 2.4. Global Innovation Index	43
Introduction	43
Conclusion	43
Evaluation	44
Activity 2.5 - Applied Innovation Indexes to the African Context.	45
Evaluation	45
Conclusion	46
Unit Evaluation	46
Unit Summary	46
Evaluation	46
Unit 3. Innovation and Intellectual Property Rights	48
Introduction	48
Unit Objectives	48
Key Terms	49
Learning activities	50
Activity 3.1 - Innovation Planning	50
Introduction	50
Conclusion	50
Activity 3.2 - Innovation Intellectual Property Rights Management	51
Technological.	51

Introduction	51
Evaluation	51
A patent	52
The Nature of Patentable Inventions	52
Types of Patents	52
Trade Secrets	54
Trade Secrets	54
Steps to be taken in order to maintain Secrecy in an Organization.	55
Licensing.	55
Product Safety and Liability	56
Conclusion	56
Evaluation	57
Activity 3.3 - technological innovation of products and rights.	58
Intellectual Property	58
Introduction	58
Conclusion	58
Evaluation	59
Unit Summary	59
Unit Evaluation.	60
Evaluation	60
Unit 4. Case Studies	62
Introduction.	62
Unit Objectives	62
Key Terms	63
Learning activities	64
Activity 4.1 - Innovators And Innovations From Case Studies: Global Context . .	64
Introduction	64
Conclusion	64
Activity 4.2 - Innovative and Innovations	65
Conclusion	65

Evaluation	65
Mapping innovation indicators,	66
Activity 4.3 - Study Strategic Management Of Organization-Based	
Technological Innovation Projects	66
Introduction	66
Conclusion	67
Evaluation	67
Unit Summary	67
Unit Evaluation.	68
Evaluation	68
Required Readings and other resources:	69
Unit Evaluation.	70
Unit Summary	70
Module/Course Summary	71
Evaluation	71
Course References	72
FINAL EXAMINATION	73

Course Overview

Welcome to Technology Innovation!

Welcome to the Technology Innovation module. The term technological innovation borrows heavily from innovation. It is applied to the products and services resulting from innovations. Technological innovation relates everything that happens on the border of knowledge, generating innovation through research or investment, increasing the efficiency and effectiveness of the services or products related to this innovation.

The theme of innovation has received much importance in the contemporary technological moment. It is a concept that is most frequently used in relation to creation of new products or processes in knowledge intensive organisations. The process of change is very present in all areas of society, and innovation is at the center of all activities. The word innovation is related to the act of innovating - the act of doing something new.

The Technological Innovation is related to scientific and technological developments, which is why you use the term Science, Technology and Innovation (ST & I), featuring dynamic processes that have profound impact on the economy, the environment and the reorganization of society.

Technology innovation module is a well-structured module for senior class aimed at enhancing and improving the skills of entrepreneurship. It gives insights and invaluable information on the various types of technology and innovation and how an organization can develop an innovative culture by ensuring that certain factors prevail.

This module appreciates the existence of an organization culture as a spring-board and anchor to innovation. Technology when used appropriately translated to the commercialization of an idea which by and large leads to innovation in an organization. Business enterprises considered to be entrepreneurial ventures must innovate or perish, it is therefore imperative that all entrepreneurs embrace the spirit and culture of innovation for their survival and growth. Innovation just like change can receive resistance by various stakeholders in an organization, this module therefore expounds on the innovation process and cycle and the general management of innovative ideas, resistance to innovation, ethical issues and adoption of innovation.

By studying this module, you should be able to visualize and illustrate the nature of innovation in organizations, individuals and their careers. This competency requires the students to develop management strategies of innovation, based on technological innovation projects in organizations.

Prerequisite Course or Knowledge

Entrepreneurship

Number of Hours

120 hours

Course/module rationale

As a general education, learners should be able to develop innovative qualities.

Materials

The materials required to complete this course are:

Listed books for each unit

Listed Internet materials and your own Internet search

On-line links and other relevant materials that may be initiated by learners from their case studies of their country's project experience

Módulo da UVA

Course Goals

Upon completion of this course the learner should be able to:

1. Identify products and services resulting from technological innovation.
2. Demonstrate a good understanding of the set of skills in technology and emerging innovation.
3. Organize management strategies based on technological innovation projects.
4. Implement innovative technological tools to the organization's success.
5. Develop a greater understanding of the best and most current research on technological innovation and its impact on life

Units

Unit 0: Pre-Assessment pain, characteristics, values and virtues of the entrepreneur and leadership.

Unit 1: Introduction to technological innovation, innovation sources, innovation models.

In this unit, you will describe the main terminology used in technological innovation products and services. You will have contact with the innovation classification parameters in the technology sector. Benefits of technological innovation and its impact on individuals, organizations and society.

Unit 2: Innovation Indicators - International Innovation Index, innovation rates applied to the African context.

In this unit, you will become familiar with the innovation policies in the world, innovation strategies commonly used by entrepreneurs and business organizations. This knowledge will be important to identify and build an innovation indicators ratio applied to the African context and their country.

Unit 3: Innovation and Intellectual Property Rights.

This unit seeks to provide an overview of the relationship between technological innovation and the need for protection of intellectual property that characterizes this invention, while discussing their ethical implications.

Unit four: Case studies of innovative and innovations (local context vs. Global Context); Study strategic management of the organization based on technological innovation projects.

This unit will be based on case studies of innovative and innovations: Global Context, innovative and innovations: Local Context and study of strategic management of the organization based on technological innovation projects

Assessment

Formative assessments, used to check learner progress, are included in each unit.

Summative assessments, such as final tests and assignments, are provided at the end of each module and cover knowledge and skills from the entire module.

Summative assessments are administered at the discretion of the institution offering the course. The suggested assessment plan is as follows:

1	Final Examination	60%
2	Unit 0 Assessment	10%
3	Unit 1 to 4 Projects & cases	30%
4	Total	100%

Schedule

Unit	Activities	Estimated time
Unit 0: Pre-Assessment pain, characteristics, values and virtues of the entrepreneur and leadership	Activity 1. Diagnosis,	10 hours
	Activity 2. Review of key concepts and	Total 10 hours
	Activity 3. entrepreneurial principles applied to technological innovation.	
Unit 1: Introduction to technological innovation, innovation sources, innovation models	Activity 1. Introduction to technological innovation,	10 hours
	Activity 2. innovation sources,	
	Activity 3. innovation models.	10 hours
	Activity 4. Introduction to Innovation	10 hours
		Total 30 hours

Technology Innovation

Unit 2: Innovation indicators - International Innovation Index, innovation rates applied to the African context	Activity 2-1.innovation indicators	05 hours
	Activity 2-2.Global indices of Innovation	05 hours
	Activity 2-3. Applied Innovation indices African Context	10 hours
		Total 20 hours
Unit 3: Technological Innovation and Intellectual Property Rights	Activity 3-1 Planning Innovation	06 hours
	Activity 3-2. Intellectual Property Rights Management of Technological Innovation	07 hours
	Activity 3-3. Technological innovation of products and intellectual property rights	07 hours
		Total 20 hours
Unit 4: Case studies of innovative and innovations (local context vs. Global Context); Study strategic management of the organization based on technological innovation projects.	Activity 4-1.Case studies of innovative and innovations: Global Context	10 hours
	Activity 4- 2. Case studies of innovative and innovations: Local Context	10 hours
	Activity 4-3. Study strategic management of the organization based on technological innovation projects	20 hours
		Total 40 hours
	Grand Total	120 hours

Readings and Other Resources

The readings and other resources in this course are:

Unit 0

Readings and other required resources

Jerome Mendes. The Entrepreneur's Handbook - How to Build a Successful Business. 2nd ed. Brazil - Sao Paulo: Editora Atlas SA 2015

Geciane Silveira Porto (ed.). Management of Innovation and Entrepreneurship. Brazil - Rio de Janeiro: Elsevier Editora Ltda. 2013

J Tidd, Bessant and K. Pavitt managing innovation: Integrating Technical, Market and Organizational change, Wiley. 2005

Optional Readings and other Resources

Dilemma of Innovation: The revolutionary book that will change the way you do business (Paperback) by Clayton M. Christensen.

We do not consider relevant indicate a directed reading. This book presents contents related to covered in this unit, you can optionally access to the contents of the chapters that find it necessary to deepen your study!

Unit 1

Required Readings and other resources::

Fernando Trias de Bes; Philip Kotler. The Bible Innovation - key principles to bring the culture of innovation organizations. Brazil - Sao Paulo: Text Editors Ltda. 2011

http://www.josedornelas.com.br/wp-content/uploads/2008/02/Exercicios_5.pdf

Optional Readings and other Resources:

The Dilemma of Innovation: The revolutionary book that will change the way you do business (Paperback) by Clayton M. Christensen.

We do not consider relevant indicate a directed reading. This book presents contents related to covered in this unit, you can optionally access to the contents of the chapters that find it necessary to deepen your study!

Unit 2

Required Readings and other resources:

Fernando Trias de Bes; Philip Kotler. The Bible Innovation - key principles to bring the culture of innovation organizations. Brazil - Sao Paulo: Text Editors Ltda. 2011

Geciane Silveira Porto (ed.). Management of Innovation and Entrepreneurship. Brazil - Rio de Janeiro: Elsevier Editora Ltda. 2013

Optional readings and other resources:

We do not consider relevant indicate a directed reading. These resources (books and scientific paper) have content related to covered in this unit, you can optionally access to the contents of the chapters that find it necessary to further deepen its study!

The Dilemma of Innovation: The revolutionary book that will change the way you do business (Paperback) by Clayton M. Christensen.

http://rusp.scielo.br/scielo.php?script=sci_arttext&pid=S0103-99892011000200013&lng=pt&nr=iso

Unit 3

Required Readings and other resources:

Readings and other required resources:

Fernando Trias de Bes; Philip Kotler. The Bible Innovation - key principles to bring the culture of innovation organizations. Brazil - Sao Paulo: Text Editors Ltda. 2011

GecianeSilveira Porto (ed.). Management of Innovation and Entrepreneurship. Brazil - Rio de Janeiro: Elsevier Editora Ltda. 2013

The Tipping Point: How Little Things Can Make a Big Difference (Paperback) by Malcolm Gladwell

Readings and other optional Resources:

We do not consider relevant indicate a directed reading. These books present content related to covered in this unit, you can optionally access to the contents of the chapters that find it necessary to deepen your study!

Liability on the Internet and In Other Media. Enio Santarelli Zulianie et al. GV series LAW, São Paulo: Saraiva, 2007.

The Innovative Solution: Creating and maintaining a successful growth (Hardcover) by Clayton M. Christensen

Legal Aspects of Procurement Informatics and Telematics. Newton Lucca. São Paulo: Saraiva, 2003. [http](#)

Computer law. LilianaMinardipaesani. 6th ed, São Paulo:Atlas, 2007.

http://pt.wikipedia.org/wiki/Direito_da_inform%C3%A1tica

Legal aspects of the Internet.Gustavo Testa Correa. 3rd ed, São Paulo:Saraiva, 2007.

http://www.portaldogoverno.gov.mz/Legisla/legisSectores/edu_leg/direitos_autores.pdf

Unit 4

Required Readings and other resources:

Making Ideas Happen: Overcoming the barriers between vision and reality (Hardcover) by Scott Branson

Geciane Silveira Porto (ed.). Management of Innovation and Entrepreneurship. Brazil - Rio de Janeiro: Elsevier Editora Ltda. 2013

Optional Readings and other Resources:

We do not consider relevant indicate a directed reading. These books present content related to covered in this unit, you can optionally access to the contents of the chapters that find it necessary to deepen your study!

The Art of Innovation: Creativity Lessons from IDEO, a leading design company in America (Hardcover) by Tom Kelley (it was named 25 times as innovation)

Robert K Yin: Case Study Methods. COSMOS Corporation. 2004. Available at: <http://www.cosmoscorp.com/Docs/AERAdraft.pdf>

The Innovative Solution: Creating and maintaining a successful growth (Hardcover) by Clayton M. Christensen

The Tipping Point: How Little Things Can Make a Big Difference (Paperback) by Malcolm Gladwell

Unit 0: Technology Innovation

Introduction

The purpose of this unit is to determine your grasp of knowledge related to this course.

This unit has the main goal to help you review your knowledge about entrepreneurship and consolidate the concepts and terminology associated with entrepreneurship, which are relevant to an understanding of technological innovation.

In this unit, you will highlight the concepts related to the entrepreneur, characteristics, values and virtues of important entrepreneur for his/her professional life as an innovative in its use and production technologies.

To start studying this unit, you will have to read the book "Innovation Management and Entrepreneurship" of Geciane Silveira, pages 1-14 and chapters 1, 2 and 4 of "The Entrepreneur's Handbook" Jerome Mendes. These books are fully presented in "Readings and other resources" of this unit.

Unit Objectives

Upon completion of this unit, you should be able to:

1. Characterize the operational concepts of entrepreneurship.
2. Explain the relationship between the entrepreneur and the innovator.
3. Analyze the principles/characteristics of entrepreneurship that contribute to technological innovation.

Activity 1. Diagnosis

A diagnosis of entrepreneurial business is an overview of the various forces involved and to determine the current status of a company and determine its future. This diagnosis is used to formulate goals and corporate strategies, from which there will be other goals and strategies in functional areas and business units, as well as the criteria and processes for decision making. Strategic alignment of the company's mission and objectives.

Technological innovation must be in accordance with the corporate strategy and depends on it. Diagnosis of a business may require some level of environmental scanning both internally and externally to be able to identify the current situation of the organization. The situation analysis can also be referred to as the SWOT analysis which we can discuss in the following section.

SWOT analysis:

SWOT analysis (English: Strengths, Weaknesses, Opportunities, Threats) is the SWOT analysis (Strengths, Weaknesses, Opportunities and Threats) in Portuguese. The SWOT analysis is a tool used to analyze the strategic position of the company in a given scenario or environment in question.

Key Terms

Entrepreneur: The term used to refer to an individual who organizes and operates one or more companies, making decisions on how to obtain and use resources, thereby assuming risks (mainly financial) in the enterprise, since the profit is one of the determining factors in business .

Entrepreneurship: It is a skill set for the production of ideas, construction, management and development of projects and businesses of any kind. Entrepreneurship is the main factor promoting economic and social development of a country.

Company: It is an economic activity carried out professionally by the entrepreneur through the articulation of productive factors for the production or circulation of goods or services. The company's owners are called entrepreneur or business company.

Rating firms: According to the dimensions of the company (turnover, number of employees) and based on parameter settings set by the governments of its administrative regions (country, state, provincial, district), companies can be classified as micro, small, medium and Big companies.

Creativity: This is the act of creating new ideas.

Goods: Goods are tangible items that can be used to satisfy human wants.

Innovation: Innovation Involves a process of creating and applying the new ideas created. It is important to note that creativity is the foundation of innovation. When ideas have been generated they must go through a process of commercialization in order to generate useful products, and that is the point of innovation.

Services: These are intangible items which cannot be seen but are often felt, if offered in the manner required by a client/customer will satisfy the needs and wants of those who seek them.

The role of the entrepreneur as an innovator

The relationship between an entrepreneurs and an innovator is that entrepreneurs identify business opportunities, seize these business opportunities, seek the resources to transform opportunities into profitable business and the innovator identifies the ideas that are profitable and commercializes the ideas into practical things, processes, goods and services that can be commercialized and sold to earn profits. There is therefore a very thin line between an innovator and an entrepreneur.

http://www.slideshare.net/openinnovation/10-types-of-innovation?next_slideshow=1

<http://www.slideshare.net/BabasabPatil/crevativty-innovation-ppt-mba>

Activity 3. Entrepreneurial principles applied to technological innovation.

Entrepreneurial Principles

Entrepreneurship calls for capacity for initiative and proactivity in ideas and action that will lead to creation of processes, systems goods and services

Entrepreneurship must involve fertile imagination to conceive ideas

Entrepreneurship requires a high level flexibility to adapt to dynamic nature of business environment,

Entrepreneurship requires creativity to transform ideas into practical goods or services

Entrepreneurship must have high level of innovation which should come from within the entrepreneurs and also from external factors (intrinsic and extrinsic motivation respectively)

Entrepreneurship must possess the ability to perceive changes as new opportunities.

Entrepreneurship requires high levels of commitment to an enterprise

Entrepreneurship involves risk taking and not risk averseness

Entrepreneurship calls for hard-working and a lot of time allocation for the enterprise

Entrepreneurship require patience and resilience in operating a business venture

Importance of entrepreneurship

A consistent and sustainable entrepreneurship increases social opportunities of individuals and enables the competitiveness of the local economy, increasing income and forms of wealth, while ensuring the conservation of resources. Micro entrepreneurs, small and medium enterprises play a key role in the economic, technological, cultural, environmental and social development of any country.

Summary

Everybody is an entrepreneur in one way or the other. In fact, not everybody is born with entrepreneurship features. However, we can acquire it slowly and gradually to the extent that the survival instinct forces us to get out of the comfort zone, going to fight and overcome the difficulties encountered along the way, firm continue in order to create something of value for us and for society, thousands of which are released every day in the complex world of business without the slightest vocation to undertake and, for some reason, thrive, becoming entrepreneurs and reference for many. Innovation stems from a process of creativity which is idea generation and careful analysis and application of the ideas. Innovators are therefore entrepreneurs who can display the idea and their respective benefits in mind before implementing.

Unit Assessment

Check your understanding!

Diagnostic Evaluation of Technological Innovation discipline

Before performing the diagnostic evaluation of Technological Innovation discipline, take a little time (about 10 hours) to review your notes on the basics of entrepreneurship that interest for Technological Innovation. This reading can be enriched with the resources we put at your disposal in "Readings and other course resources". Consider the following readings: Geciane Silveira Porto (ed.). Management of Innovation and Entrepreneurship. Brazil - Rio de Janeiro: Elsevier Editora Ltda. 2013

Rating criteria

This review is individual and should be performed after the readings recommended compulsory and free consultations on entrepreneurship and its importance to technological innovation. She has a 10% weight on the overall evaluation of the Discipline Technological Innovation.

Evaluation

Prepare an essay (article), a maximum of seven (7) pages, establishing the relationship between entrepreneurship and innovation, with emphasis on technological innovation. Give privilege to present contextualized examples with your city, country or continent to elucidate these relationships. Consider contemplate the phases of the entrepreneurial process: (1) identification and evaluation of opportunities, (2) development of the business plan, (3) determining the necessary resources, (4) management of the enterprise

Unit Readings and Other Resources

The readings in this unit are to be found at the course-level section "[Readings and Other Resources](#)".

Required Readings and other resources:

Jerome Mendes. The Entrepreneur's Handbook - How to Build a Successful Business. 2nd ed. Brazil - Sao Paulo: Editora Atlas SA 2015

Geciane Silveira Porto (ed.). Management of Innovation and Entrepreneurship. Brazil - Rio de Janeiro: Elsevier Editora Ltda. 2013

Readings and other optional features:

This book presents contents related to covered in this unit, you can optionally access to the contents of the chapters that find it necessary to deepen!

The Dilemma of Innovation: The revolutionary book that will change the way you do business (Paperback) by Clayton M. Christensen

Unit 1. Introduction To Technology Innovation

Innovation Sources, Innovation Models

Introduction

Welcome to this unit, In this unit you will be expected to have an understanding of the terminologies used in technological innovation with regards to products and services by defining what these terms mean. You will have contact with the innovation classification parameters in the technology sector. You will also appreciate the Benefits of innovation in general and finally the benefits of technological innovation and its impact on individuals, organizations and society.

Benefits of innovation

Increasing productivity, improving processes, offering improvements and more choice to our service users and decreasing costs are some the most easily recognizable benefits of innovation.

While the benefits of change leads to greater organizational effectiveness. By addressing staff's concerns, it can accelerate the adoption of new processes and technology that boosts organizational effectiveness and efficiency. By placing people front and center in the change process, it improved work quality and morale thus improve the service we deliver to our service users.

It enhances communication by encouraging dialogue and circulating the information people need to know leads to a more cooperative, and more productive, environment.

A carefully thought-out approach to change reduces stress and turmoil and encourages people to stay loyal to organization which minimizes staff turnovers. Having an effective organization with good morale and knowledgeable employees deliver the benefit most changes are designed to provide - better and more cost effective service to service.

The presence of a genius can help with innovation – it may speed up the end result by having a person who can see and make the future happen. However, innovation is more than the work of any one. Innovation involves the taking of the work of an individual (or team) of inventors and taking it to others to translate to practical use (commercializing innovation)

The future of many businesses depends upon their ability to innovate.

Competition is fierce. Knowledge spreads quickly. The ability of a company to not only keep up with its current business practices, but to exceed its own – and its competitors' expectations are critical to survival.

Unit Objectives

1. Characterize the operational concepts of technological innovation.
2. Identify the sources of technological innovation.
3. Explain the relationship between technological innovation and the socio-economic and cultural development of a country.
4. Identify operating models and innovation classification criteria in the technology sector.
5. Identify research products in technological innovation.

Key Terms

Innovation:

Innovation is the strategic process employed by the organization in creating new elements, new values and new capabilities to resources, processes, products / services, the organizational techniques, to business or any other relevant component model for achieving the goals organization. An innovation is useful only to the innovator if it is offered to others for use. If an entrepreneur improves some product, process or service for the public, then that invention transforms into an innovation.

An innovation can be big or small. Brand-new or just a bit different, it doesn't matter. An innovation can be clearly complex or seemingly simple. Innovations are often thought of in terms of technical achievement, but can also be a design. The type, industry and style of innovation are irrelevant; an innovation's impact determines its qualification. Innovation involves one percent(1%) ideas and ninety nine percent

(99%)commercialization/execution into practical things that will add value to the customer/client.

Technological innovation:

Technological innovation is a term applicable to innovations in processes and products with resources to techniques and technologies that do not exist in the organization (firm), man creates or recreates, adapt and use to meet their limitations in creative processes, whether in micro, Small, Medium and Large businesses.

Importance of technological innovation:

The importance of innovation is to contribute to take the organization to achieve its goals and increase business competitiveness. However, technological innovation should enable enterprises to master the art of predicting the future needs of customers, products and devising new and quality services at lower costs.

Corporate innovation strategies:

As a corporate level innovation strategies will define the actual scope of the company's activities and relationships with other companies. These strategies can be vertically integrated (up-downstream), horizontal (diversification) and strategic alliances.

Learning Activities

Activity 1.1 - Introduction to Innovation

While we recognize that the ability to innovate is key to the competitiveness of companies and nations in the context of globalization, the concept of innovation is still not discussed deeply and between corporate executives, both among social scientists or philosophers. In this activity, you will explore the operational concepts of technological innovation, as well as identify research products in technological innovation.

Details of the activity

To complete the study on the Introduction to Innovation, you must solve a written text (individual) on innovation and its impact on the lives of individuals, enterprises and society. This activity has the weight of $\frac{1}{3} * 10\%$ of the total evaluation of the course. You need to devote 10 hours of optional readings, in addition to the book "The Bible Innovation" displayed on this unit (Ch. I and III).

Activity 1.2 - Innovation sources

This section gives a highlight on the various sources of innovation. The sources can either be internal or external. Many people believe that creativity is the most common aspect of innovation, it is still a common belief that creativity and innovation can be used interchangeably to refer to as the only source of innovation. It is true that some level of human talent, when properly applied and managed can lead to innovation. However, an organization full of creative people is not necessarily an innovative organization.

People propose ideas and due to the lack of clear rules about what to do with them, these ideas fail without producing any results. Thus, people get discouraged and stop proposing new ideas. Encourage them to do it again will be more difficult the second time around.

Creativity therefore becomes innovation when the ideas created can translate into useful processes which can be repeated for creation of either goods or services that can benefit the society. IBM, for example uses the talents of the employees of the company who are on top of the career to turn new ideas into new business lines. We can therefore agree that creativity can be considered as one of the sources of innovation. Let us also consider other common innovation sources that may not necessarily be creativity related. These sources are as follows:

Research and development (R & D) and marketing sector.

Another source of innovation is through utilizing Research and Development of the organization. Innovation can come from any part of an organization and can be internal or external, and must be selected, coordinated and managed, as key to the company's future.

Internal sources

Innovation may also be generated from within the company - Proposals made by the staff of R & D sectors, marketing, production and other sectors to identify those opportunities without having a specific assignment.

External sources:

Innovation could also come from external sources (outside the company). For example:

Market analysis.

Innovation can include: analysis of the dynamics of other competitors; the acquisition of incorporated and unincorporated technology; listens to customers; consultancy reports; suppliers; research institutions; patent disclosures; conferences; professional journals; fairs and exhibitions of science and technology.

End user source/customer/client source

Most innovations have emanated from customer complaints or customer suggestions. This could come as a result of improvement of the already existing products or commercializing of an idea that results into introduction of totally a new product into the market as a result of customer suggestions. Customer/client complaints may pose challenges that may trigger innovation by searching for solution on the challenge.

These challenges may determine the kind of ideas generated. New product ideas might be developed into prototypes. Process efficiency ideas may be modeled. Marketing ideas may be evaluated in consumer surveys and so on. The purpose of developing ideas is to test them in the business environment and, if no insoluble problems are discovered, prepare them for implementation

Innovation from Suppliers

Innovation source can also be from either service providers or input providers who may have talents and ideas on how a process/product/service can be improved to come up with something new that may bring value addition to the end users of the commodities.

Innovation from Brain-storming

Innovation can also be from collaborative idea generation in form of a brainstorming activity, through the use of real idea management software or a team may be assigned to devise and develop ideas. You could even generate ideas yourself, but as a general rule, diverse teams generate more creative (both in terms of quantity and quality) than individuals -- at least in the right circumstances. For this to happen, it requires team-work and an environment where such collaborations can be nurtured and developed.

Whatever method of idea generation you use, it should ideally be in a collaborative environment in which people can work together to develop ideas. Ideally, there should be no criticism, censorship or destruction of ideas during this phase. You want to encourage people to think creatively and be unafraid to suggest ideas. Early criticism of any kind will only make people reluctant to share ideas, especially their most outlandishly creative ideas (in other words, the best ideas), for fear of also being criticized.

In collaborative innovation, team players and leaders need to need ideas to keep the process going to create an environment for generating creative ideas means that will culminate to resulting innovations that produces a team that is more innovative! The team/teams must combine similar ideas into idea clusters or big ideas. Each idea cluster can be processed as a single idea, thus making the next steps of the process more efficient.

<http://www.slideshare.net/ingosigge/creativity-innovation-18790832/29>

Conclusion

By studying the activity "Introduction to Innovation" you became aware of the benefits of technological innovation and its impact on the lives of individuals, organizations and society. Through technological innovation, enterprises will be able to improve their productive and creative processes can generate wealth and continuously improve their competitiveness by the companies in the same line of business and eventually stay ahead of its competitors in the market.

Evaluation

when a high executive of a company demand more creativity or innovation, automatically assume that employees are being asked to create new and amazing products or services. Review this statement showing the source of innovation and creativity.

Introduction

In Unit 0 of this module (course), you studied that innovation stems from a process of careful analysis and early ripening and entrepreneurs who can display the idea and their respective benefits in mind before implementing it. However, in most cases, the sources of innovation have been extraneous to the company, causing companies to use its competitors as the basis for their own innovation initiatives. In this activity, you will investigate the possibilities of creating technological innovation strategies more competitive and complying with internal sources of the organization or to other companies in different fields of activity of the company that aims to make technological innovation.

Activity Details

Based on knowledge about the sources of technological innovation, you should answer the questions referred for evaluation of activity 1.2. This activity has the weight of $\frac{1}{3} * 10\%$ of the total evaluation of the course. You need to devote 10 hours of optional readings, in addition to the book "The Bible Innovation" displayed on this unit (Ch. II and IV).

Conclusion

To complete the activity on "Innovation Sources" you acknowledge that the success of product and service innovation depends on a plan of technological innovation that considers better coordination among stakeholders (companies and their employees, customers, suppliers); that is, a good technological innovation strategy focuses on the implementation of the culture of innovation in products and services, as well as in all segments with which the company relates.

Evaluation

1. Consider a company (small, medium or large company) of the town where you live. Characterize the type of activity undertaken by the company.
2. Present potential customers and competitors.
3. Explain hypothetically as two internal and external factors can contribute as sources of innovation in this venture.

Activity 1.3 - Innovation Models

Introduction

Innovation models give a representation of the type of good or services that one intends to produce. For example a particular company can claim that their innovation processes become more focused on the market and more customer oriented. But surprisingly, in some cases and in such a short time, the failure rate for new products become unacceptably high, affecting the relationship of their investments in innovation and value capture, leading to failure. The following are some of the innovation models used to explain application of technology innovations in organizations.

The Cyclic Innovation Model



<http://www.cneval.com/index.html>

This model was developed by Guus Berkhout (2000). It assumes that effective market introduction of products and services does not take the shape of a linear function but rather it is a cycle which has interactions between different actors and players of innovation. This innovation model combines technology push- what drives the supply process transitioning into applied science, to product development, to marketing - and what pulls a market - a demand driven pipeline process leading to market opportunity on one side, to product development, to applied and fundamental science as indicated in the cycle above.

The model explains why a holistic multi-disciplinary view is required to develop effective policies to facilitate the innovation system and why short planning, implementation and feedback cycles provide the best results.

Technology hype curve model

This was developed by Gartner(1995). Hype Cycles is used to characterize the excitement that comes with innovation and the disappointments that come with it when things are not working as expected when a new technology has been introduced into an organization. A Hype Cycle represents graphically the maturity, adoption and business application of technology innovations. The figure below indicates various technologies that have experienced the hype curve.



www.cneval.com/index.html

Technology hype curve has the following stages :

Stage 1 Technology Trigger: This is the first phase of a Hype Cycle . It shows a breakthrough into a product launch that may have significant interest into an organization.

Stage 2 Peak of Inflated Expectations: This is the second phase of the hype curve. In this phase, a passion of making publicizing the technology innovation triggers generates excitement and impractical expectations. At this point we expect some success and of course also some failures. There may be some successful applications of a technology, but there are typically more failures.

Stage 3 Trough of Disillusionment: At this stage Technologies transition through a state of disillusionment when organizations fail to meet their technology expectations and soon they become out of fashion leading to abandonment of the technology by the media.

Stage 4 Slope of Enlightenment: Whereas the media may have terminated publicizing covering the technology, certain businesses may still carry on to the next stage by experimenting further with a view to appreciate the paybacks of applying the technology.

Stage 5 Plateau of Productivity: When the benefits of application of technology has been experienced and generally accepted, the level of productivity may reach its peak and stagnate. At this point, the press, public as well as the organization get used to the technology and productivity level becomes stable and that technology no longer creates enthusiasm to the various stakeholders who hear about it or who apply it practical

This releases the technological innovation process is full of barriers and restrictions that can be minimized and overcome. The innovation model A-F comprises the following basic functions:

1. activators,
2. search engines
3. creators
4. developers
5. executors
6. facilitators

With the adoption of innovation and improved models in this activity you should develop an understanding of the innovation model A-F as a list of basic functions, which proved best innovation practices in reputable companies such as IBM, Google, Apple, Toyota, Nokia, BMW, Microsoft.

Activity Details

1.3 In this section, you examined the need to adopt models for the development of a fairly consistent technological innovation project. The following is an exercise to evaluate their learning. This activity has the weight of $\frac{1}{3}$ * 10% of the total evaluation of the course. You need to devote 10 hours of optional readings, in addition to the book "The Bible Innovation" displayed on this unit (Chap. II, III and IV).

Conclusion

Considering the diversity and uniqueness of the companies, it can be stated that there are several types of innovation corresponding to different conditions for its realization. Some types of innovation do not require new technologies, but new ways to leverage existing technologies. A successful innovation project depends on market analysis of barriers and constraints facing the innovation this company in this particular context.

Reputable companies such as, IBM, Google, Apple, Toyota, Nokia, BMW, Microsoft, achieved good results in the time and resources invested in innovation by applying the innovation model Technology hype curve model and the cyclical model.

Evaluation

Consider a company (small, medium or large company) of the town where you live, presented in activity 1.2. Demonstrate how the model A-F to produce technological innovation of a product or service that your team is performing as proposed would be implemented.

Unit Summary

At this juncture I would like to involve you in giving a summary of what we have learned in this unit. Briefly do a summary of what entails this unit, You may need to give your view on the terminologies and if you can illustrate by known examples that will greatly improve your understanding.

Innovation is always a process that requires taking on challenges at any given time, your results may be satisfactory or not. The executives recognize the importance of technological innovation, yet it is a messy process, Innovation can be informal because it is difficult to measure and manage. An organization that does not innovate is in serious danger of losing his place for the competitors in the industry in the market. Individuals and organizations innovate wherever possible to adapt to the reality of the moment and the global market

Check your understanding!

Instructions

To complete the study on the Introduction to Innovation, sources of innovation and innovation models, you must write an essay on innovation and its impact on the lives of individuals, enterprises and society. You need to devote 10 hours of optional readings, in addition to the compulsory reading works set out in "readings and other resources" of this unit

Unit Assessment

Check your understanding!

Instructions

To complete the study on the Introduction to Innovation, sources of innovation and innovation models, you must write an essay on innovation and its impact on the lives of individuals, enterprises and society. You need to devote 10 hours of optional readings, in addition to the compulsory reading works set out in "readings and other resources" of this unit.

Rating criteria

This activity has a 10% weight in the overall evaluation of the course.

Evaluation (Continuous Assessment Test)

1. Original man has evolved over time, new configurations of society shows that man is now more stabilized. The technology and innovation constituted a crucial factor for the development of individuals, organizations and society.
2. Present your arguments on how to sustain the technical and innovation contributed to the humanization of man, from the "Homo Erectus" to "contemporary man".
3. .What is the role of technological innovation to help mitigate the effects of the problems of the XXI century (urbanization problems of societies, environmental, public health and educational problems).
4. Presents three arguments for the adoption of innovation model A-F.

Unit Readings and Other Resources

The readings in this unit are to be found at course level readings and other resources.

Required Readings and other resources :

Fernando Trias de Bes ; Philip Kotler . The Bible Innovation - key principles to bring the culture of innovation organizations . Brazil - Sao Paulo: Text Editors Ltda . 2011 (Sec. I, II , III and IV) .

http://www.josedornelas.com.br/wpcontent/uploads/2008/02/Exercicios_5.pdf

Optional Readings and other resources:

These resources have content related to covered in this module, you can optionally read the chapters that you find necessary to deepen your study..

The Dilemma of Innovation: The revolutionary book that will change the way you do business (Paperback) by Clayton M. Christensen.

http://www.fpl.edu.br/2013/media/pdfs/mestrado/dissertacoes_2007/dissertacao_margarida_maria_souto_fantoni_2007.pdf

Unit 2. Innovation Indicators

International Innovation Index, innovation rates applied to the African context

Introduction

Now that you have learned in previous units the basics of Technological Innovation, and have reviewed some innovation sources and the most common innovation model, this unit will devote attention to the Measures / Indicators of Innovation.

In this unit, you will become familiar with the innovation policies in the world, innovation strategies commonly used by entrepreneurs and business organizations. This knowledge will be important to identify and build innovation indicators ratio applied to the African context and their countries.

Unit Objectives

Upon completion of this unit, you should be able to:

1. Identify the criteria used to measure the technological innovation of entrepreneurs and organizations.
2. Identify the main organizations of operation and management of technology innovation policies in their country and the world.
3. Explain the benefits of the existence of institutions that take care of the preparation and supervision of technological innovation policies.
4. Develop the indicators of innovation and research products and technological innovation.
5. Explain the role of science, technology and innovation for the development of the economies of African countries.

Key Terms

Indicator: According to Oliveira (2006, p. 145), we can consider an indicator as "a parameter and evaluation criteria previously established that allows the verification of achievement as well as the evolution of the activity" or the process of an entrepreneur or company.

Activity 2.1 - innovation indicators

Innovation indicators are relatively new. Innovation indicators involve a set of tools and a system to measure the innovativeness of an organization. It is important for any organization to have some indicators of innovation indicators that can be used to monitor and even develop learning in the same organizations. The indicators can be used also as a checks and balance mechanism to tell if the organizational workers are on track or if they need to have some skills updated on technology and innovation capacity building.

Importance of indicators:

The increased importance of the indicators are in fact assist in monitoring the activities and results through the control, indicating the relationship between planning and outcome, enabling managers to measure processes, services and products of the company. Any organization ought to have some control mechanism which can be in form of a metric or a standard measure that can be used to tell if innovation is actually on course or not.

Indicators rating:

The indicators can be descriptive, numeric (figures/numbers), quantitative and qualitative in terms of narrations or elements that can be put on a scale.

Descriptive indicators:

This consist of the use of descriptions and adjectives to represent the performance of a particular process, service and product of an entrepreneur and the company. In most cases the descriptive indicators will describe a given behaviour compared to the desired behaviour. It may also indicate areas of desirability and areas that are very essential for innovation to take place. The essential behavioural characteristics may simply indicate the behaviour that is required accomplish a task, while the desirable behavioural characteristic is what may give a person the 'X' factor or the unique factor that may be used to bring about innovation.

Numerical indicators

Consist of the use of absolute numbers/figures or numerical relationship between two events. These indicators provide hard statistical data that may be used against actual performance. Organizations that use numeric indicators to determine innovation must establish the standard performance upon which reference will be made to the performance of a worker in order to determine if the level of required innovation characteristic and behaviour has been attained

Quantitative indicators:

Quantify performance are usually represented in terms percentage, volume, variable. .Again when using this method of determining innovation a given threshold should be provided.

Qualitative indicators:

These indicators quantify the performance of non-quantifiable variables such as attitudes, skills, initiative and values. This type of assessment requires experts in psychology or behavioural sciences for it to be effective.

Balanced Scorecard versus composite indicator:

Are systems of indicators or indicators that use different indices used to monitor deviations and noncompliance activities and processes, and also its consequences, see the general metrics and not just trends, and enabling the assessment of how much the entrepreneur or company reached expected results. They are multidimensional concepts that cannot be captured by a single parameter.

Balanced Score Card(BSC):

Balanced Scorecard measures is an innovation indicator that uses both financial and non-financial measures of performance. The company's performance focuses on four perspectives (financial, customer, internal processes, learning and growth) seeking a balance between them

The concept of Balanced Score Card (BSC) is an innovation indicator that was postulated by Kaplan and. Norton (1992) and then revised in 2003. Balanced score card identifies the vision and mission of an organization and aligns it business strategies to achieve that mission and analyzing the performance of the organization from certain perspectives to measure organizational success.

BSC is an innovation indicator that focuses on financial perspective and non-financial perspective.

Balance Score Card seeks to provide a balance in four aspects of an organization's performance from the perspective of financial, customer, business and production process and learning and growth. Following is a brief account of the four perspectives of analysis which are the core aspects of BSC.

I. Financial perspective

The financial perspective shows if company's strategy and operations add value for shareholders.

II. Customer perspective

The customer perspective reflects the business through the eyes of customers/client. It indicates to what extent the company meets the expectations of customers.

III. Business and production process perspective

This perspective gives emphasis on the performance of key internal processes which drive the organization. .

IV. Learning and growth perspective

Learning and growth perspective considers organization's potential future performance; guiding attention on the basis of all future success - the organization's people and infrastructure.

In each of these four perspectives, the managements sets certain goals and performance measures through which the attainment of these goals may be judged. The following is an example of goals and performance measures set in each of these four perspectives.

- Performance measures
- Financial perspective
- Profitability prosperity
- Return on investment cash flows

Customer perspective

Customer satisfaction quality

Complaints received/size of customer orders increasing or decreasing, own quality relative to industry standards, defect level.

Business and production processes perspective

Innovation,

Efficiency of manufacturing process

Research and development activities, manufacturing cycle times.

Learning and growth perspective

Capabilities of people,

Employee satisfaction and retention

Managers' efforts in developing people's capabilities

Rate of labour turnover i.e. % of people who leave the organization in a year.

This indicator serves mainly to the level of strategic management of the company(see Figure 1 on Balanced scorecard).



Figure 1: Balanced Scorecard

Source: http://www.businessballs.com/balanced_scorecard.htm

[Kaplan & Norton, 2003](#)

Watch this video: https://www.youtube.com/watch?v=M_IIOlywryw

Composite indicator:

An indicator compound is formed when a number of indices that are compiled into a single metric based on a given mathematical equation. For example, the Human Development Index is calculated from indicators income, education and life expectancy of nations. There are several types of composite indicators, including those that compare and rank the performance of different countries in terms of competitiveness, sustainable development, globalization and innovation (.See Figure. 2 below.)

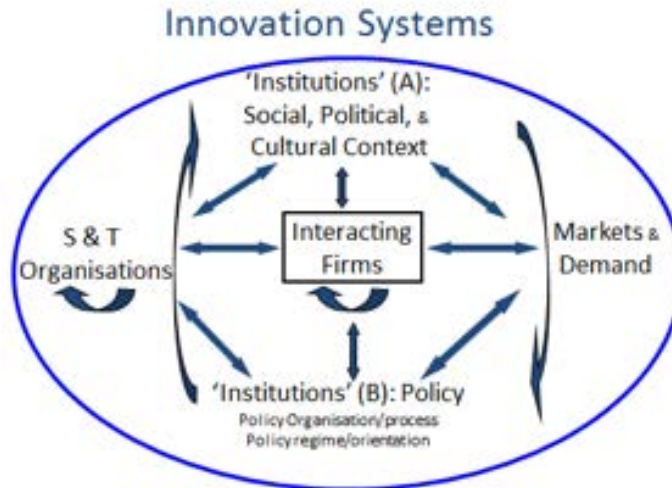


Figure. 2: Example of scientific and technological innovation system of indicators

Source: <http://rogerseirug.blogspot.co.ke/2012/07/egypt-has-been-on-precipice-being.html>

Activity 2.2 - Global Innovation Index:

The Global Innovation Index is a comprehensive measurement index measures the level of innovation in each country. It is produced jointly by the Boston Consulting Group (BCG), the National Association of Manufacturing and (NAM), and the Manufacturing Institute (MI) and non-partisan research affiliate of NAM. NAM described the index as "the most extensive and comprehensive index for this category.

Learning activities

Activity 2.3 - Innovation Indicators

Introduction

company. Measures such as the overall growth in sales and profits already are not enough to determine the performance of a company. Thus, technological innovation has become necessary for survival of the company and, therefore, the adoption of specific tools to diagnose whether they are prepared to innovate and measure the effectiveness of their innovation strategies.

In this activity, you will have to read the topics of innovation measures. Serve as a basis, the materials listed in Readings and Other Resources, this unit particularly "The Bible Innovation" (Chapter 11, pages 273-289) and others that you can find in your searches on the Internet. Study the tables presented in section details of this unit and how indicators and meanings are used which can take. Consider the study and deepening of the key terms in the beginning of this unit.

Details of the activity

The process of technological innovation is one of the faces of globalization experienced by contemporary societies. technological innovation indicators should be taken as signals (indicators) of behavioral tendencies, and not as exact measurements of the variables expressing. It follows that any decision on the organization's management policies in technological innovation aspect should be combined with other products, solutions and processes that feed the dynamics of organization

Evaluation

1. Consider the innovation institutions, existing science and technology in your country.
2. You and three colleagues compared the relationship of the institution raised by each. Select one of these institutions or their representations and schedule a study visit.
3. Develop a business roadmap that includes a survey of legislation on entrepreneurship, technological innovation between innovation and companies engaged in information and communication technologies.
4. Make a survey of the main indicators used to measure technological innovation in organizations.

Activity 2.4. Global Innovation Index

Introduction

One of the elements that contribute to improved delivery of the benefits of technological innovation is the existence of a master plan that reflects a nation's development aspirations. Thus, each country should develop a science and technology policy, cross base, with the main objective of stimulating innovation taking into account the indicators or human and institutional development pillars defined by that nation.

Activity Details

Consider the innovation institutions, science and technology visited within the Activity 1.1. This activity must be conducted in group 4 to 5 elements. Table 1 gives an illustration of global innovation ranking based on various country's indices. This provides a basis of measuring the level of innovativeness of various countries which begs the question as to why countries have variations. This ranking may trigger interrogating systems, culture, sources and even indicators of innovations used by different countries.

Conclusion

The Global Innovation Index is part of a larger research that reflects both the results of companies as the government's ability to encourage and support innovation through public policy.

Technological innovation is a salutary important partner in the ability of the companies / countries turn their resources into products and services to ensure the wellbeing of its employees / citizens and the ethical and political commitment to future generations.

The value of most goods and services of entrepreneurs and companies depends mainly on technological innovations embodied therein.

Activity Details

Consider the innovation institutions , science and technology visited within the Activity 1. This activity must be conducted in group 4 to 5 elements.

Reading addressed :

Fernando Trias de Bes ; Philip Kotler . The Bible Innovation - key principles to bring the culture of innovation organizations . Brazil - Sao Paulo: Text Editors Ltda . 2011 (Ch. II)

In Readings and Other Resources section , available at the end of the unit , you can find other books featuring content related to covered in this unit and assist in -depth study of the contents of this unit and module , if you feel the need !

Evaluation

Based on the survey of the main indicators used to measure technological innovation in organizations, made in Activity 1, discuss within the group of four colleagues, the meaning of these indicators.

Draw up a list of indicators to measure innovation in the Training Course for Technicians in Information and Communication Technologies. (If needed, there may be a reformulation of the groups).

Identify key indicators / technological innovation pillars present in the policy / strategy science and technology in your country or region. Discuss the meaning of these indicators for the local and international development.

Access the table of 20 countries best placed according to the Global Innovation Index available in https://pt.wikipedia.org/wiki/%C3%8Dndice_Global_de_Inova%C3%A7%C3%A3o site.

Table 1 Global Innovation Index ranking

Source: <http://sciblogs.co.nz/misc-ience/2013/10/09/where-does-nz-rank-in-the-global-innovation-index-2013/>

Global Innovation Index rankings

Country/Economy	Score (0–100)	Rank	Income	Rank	Region	Rank	Efficiency Ratio	Rank	Median: 0.78
Switzerland	66.59	1	HI	1	EUR	1	1.00	12	
Sweden	61.36	2	HI	2	EUR	2	0.81	55	
United Kingdom	61.25	3	HI	3	EUR	3	0.80	60	
Netherlands	61.14	4	HI	4	EUR	4	0.91	26	
United States of America	60.31	5	HI	5	NAC	1	0.74	86	
Finland	59.51	6	HI	6	EUR	5	0.79	67	
Hong Kong (China)	59.43	7	HI	7	SEAO	1	0.68	109	
Singapore	59.41	8	HI	8	SEAO	2	0.64	121	
Denmark	58.34	9	HI	9	EUR	6	0.76	78	
Ireland	57.91	10	HI	10	EUR	7	0.81	57	
Canada	57.60	11	HI	11	NAC	2	0.78	68	
Luxembourg	56.57	12	HI	12	EUR	8	0.89	33	
Iceland	56.40	13	HI	13	EUR	9	0.89	30	
Israel	55.98	14	HI	14	NAWA	1	0.87	38	
Germany	55.83	15	HI	15	EUR	10	0.87	40	
Norway	55.64	16	HI	16	EUR	11	0.76	81	
New Zealand	54.46	17	HI	17	SEAO	3	0.74	90	
Korea, Rep.	53.31	18	HI	18	SEAO	4	0.72	95	
Australia	53.07	19	HI	19	SEAO	5	0.65	116	
France	52.83	20	HI	20	EUR	12	0.79	63	

Activity 2.5 - Applied Innovation Indexes to the African

Context

In 2014, the data mobilized to prepare the analysis of science, technology, innovation and development in African countries are prone to errors due to its incompleteness derived from participation bit representative of the continent (19-35 countries) and unreliable-sources.

In this sense, conduct analyzes of the impacts of policies of innovation, research and development of African countries faced with the demands of the continent in technological innovation, with the involvement of all countries of the continent, is a strong political and strategic challenge especially when taken into account other priority issues such as hunger and food insecurity, wars, political conflicts, natural and humanitarian disasters, ... are factors of economic ,political and social development in Africa, with which they must articulate all tentative global indices of technological innovation-sketch.

Evaluation

Review the role of countries in cooperation for the development and publication of studies that provide new information in the fields of science, technology and innovation in Africa.

After participating in the debate on this issue, in person or virtually classroom (in a synchronous communication tool distance) organized by the tutor / teacher, prepare a summary of the use of technological innovation indicators in the African context.

Based on government indicators, education, patents, economics, technology transfer, migration, comment the classification of two countries your choice. (This task can be accomplished in groups of two students)

Unit Readings and other resources

Readings and other required resources:

- Fernando Trias de Bes; Philip Kotler. The Bible Innovation - key principles to bring the culture of innovation organizations. Brazil - Sao Paulo: Text Editor Ltd. 2011 (Ch. II)
- Oslo Manual. Policy proposals for the collection and interpretation of data on technological innovation.3rd Edition.1997
- African Science, Technology and Innovation Indicators Initiative.African Innovation Outlook II. -
- NEPAD Planning and Coordinating Agency. 2014
- GecianeSilveira Porto (ed.). Management of Innovation and Entrepreneurship. Brazil - Rio de Janeiro: Elsevier Editora Ltda. 2013
- In Readings and Other Resources section, available at the end of the unit, you can find other books featuring content related to covered in this unit and assist in-depth study of the contents of this unit and module, if you feel the need!

Conclusion

According to the AIO (Outlook on the African Innovation), and based on the results published in

Unit Summary

The value of most goods and services of entrepreneurs and companies depends mainly on technological innovations embodied therein.

Innovation indicators, in addition to being an evaluation system also is a diagnostic tool to predict future ability to innovate and, if possible decline, to understand how to reverse the trend before it is too late.

innovation indicators to clearly distinguish which part of the success of a company derives from innovation. These indicators should reflect the spirit of the objectives and strategy of innovation, based on primary sources of technology innovation studied in Unit 1 of this module.

Unit Evaluation

Check your understanding!

Unit 2 Rating

Since unit 2 has extensive readings and exercises that required that you apply the concepts learnt, therefore the evaluation of participation will be the average of the scores in the activities 1, 2 and 3.

Instructions

1. Summarize the answers presented in activities 1, 2, 3 and submit to the tutor / teacher module.
2. In order to give more visibility of the topics discussed in this unit, you are strongly encouraged to actively participate in discussions on technological innovation indicators by presenting their arguments on the answers given in the task 4 Activity 2.

Evaluation

You can contribute to the improvement of the thematic unit content you just study and present their suggestions and recommendations.

Rating criteria

Activity 1.1 -	3%
Activity 1.2 -	3%
Activity 1.3 -	4%

Unit Readings and other resources

Readings and other required resources:

- Fernando Trias de Bes; Philip Kotler. The Bible Innovation - key principles to bring the culture of innovation organizations. Brazil - Sao Paulo: Text Editors Ltda. 2011
- Oslo Manual. Policy proposals for the collection and interpretation of data on technological innovation. 3rd Edition. 1997
- African Science, Technology and Innovation Indicators Initiative. African Innovation Outlook II. - NEPAD Planning and Coordinating Agency. 2014
- Geciane Silveira Porto (ed.). Management of Innovation and Entrepreneurship. Brazil - Rio de Janeiro: Elsevier Editora Ltda. 2013

Readings and other optional Resources:

- https://pt.wikipedia.org/wiki/%C3%8Dndice_Global_de_Inova%C3%A7%C3%A3o.
- <http://www.portaldogoverno.gov.mz/por/Media/Files/Indicadores-ct>.
- The Dilemma of Innovation: The revolutionary book that will change the way you do business (Paperback) by Clayton M. Christensen.
- http://rusp.scielo.br/scielo.php?script=sci_arttext&pid=S0103-99892011000200013&lng=pt&nrm=iso

Unit 3. Innovation and Intellectual Property Rights

Introduction

An innovation is the implementation of a product (good or service) new or significantly improved, or a process, or a new marketing method, or a new organizational method in business practices, the organization of the workplace or external relations.

The issue of protection of intellectual property has been the subject of discussions and legislation worldwide since the twentieth century. Technology innovation is not a new product, but a product reconfigured again as a result of the development of science, technology and information and communication technologies associated with the rapid use of Internet communication. Thus, technology innovation becomes an area where there is a wide range of ethical and legal issues and intellectual property rights.

Unit Objectives

Upon completion of this unit, you should be able to:

1. Interpret the concepts and situation involving intellectual property rights on products and services resulting from science and technology innovation.
2. Advise on the classifications available in which the intellectual property in technological innovation can be evaluated.
3. Demonstrate knowledge of intellectual property rights and technological innovation.
4. Examine conflicts for non-observance of intellectual property rights in technological innovation.
5. Contribute to the debate on the central role of science and technology for the development of African countries, considering other issues like hunger / food security, education, war / political conflicts, health, access roads.

Key Terms

Technological innovation: Technological innovation is a term applicable to innovations in processes and products with resources to techniques and technologies that do not exist in the organization (firm), man creates or recreates, adapt and use to meet their limitations in creative processes, whether in micro, Small, Medium and Large businesses.

Intellectual property: It is the sum of the rights relating to literary, artistic and scientific, the interpretations of performers and performances of performers, phonograms, and broadcasts, inventions in all fields of human endeavor, scientific discoveries, drawings and industrial models, industrial, trademarks and service, as well as commercial firms and commercial designations, protection against unfair competition, and all other rights resulting from intellectual activity in the industrial, scientific, literary and artistic.

Technological innovation sources: The sources of technological innovation, the company, are not restricted to research and development (R & D) and marketing sector. They can come from any part of an organization and can be internal or external, and must be selected, coordinated and managed, as key to the company's future.

Enterprise business diagnosis: A diagnosis of entrepreneurial business is an overview of the various forces involved and to determine the current status of a company and determine its future. This diagnosis is used to to formulate goals and corporate strategies, from which there will be other goals and strategies in functional areas and business units, as well as the criteria and processes for decision making.

Strategic alignment of the company's mission and objectives: Technological innovation must be in accordance with the corporate strategy and depends on it.

Goals and innovation strategies: The policy and innovation objectives should be consistent with the objectives, strategies and mission of the company. Those objectives and strategies should be socialized and shared by all functional departments of the company (R & D, marketing, sales, human resources).

Learning activities

Activity 3.1 - Innovation Planning

Introduction

It is not a surprise to anyone that a planning well formulated innovation which generates results that improve the performance of companies that implement such a strategy. The planning of innovation is the joint responsibility of the political and strategic management company with the participation of the Director of Innovation Department or research and development (R & D).

Technological innovation should be made to a horizon of three to five years, with annual revisions of strategy and resource allocation to meet the technological changes, changes in the market (customers, suppliers), results from innovation.

Some guiding aspects of planning innovation are: 1) the diagnosis of the enterprise business, 2) the company's strategic alignment with its mission and objectives, 3) goals and innovation strategies.

Conclusion

Innovation is the first factor in the overall innovation system and allows us to align our initiatives with the business strategy, allocate financial resources efficiently and feed the flow of orderly innovation process.

A diagnosis of enterprise business aims to identify what made the company successful so far and what must be modified to maintain this success in the future. Some useful tools to make the diagnosis are the audit marketing, value stream mapping, sectoral developments.

Evaluation

Whereas the discovery / innovation can occur before the implementation of business strategy innovation, distinguish predictable innovation exploratory innovation. Infact most innovations are acts of creativity while others may occur from accidents like the discovery of liquid soap which came into existence as an accident from over-processed bar soap done accidentally.

Activity 3.2 - Innovation Intellectual Property Rights

Management

Technological

Introduction

Intellectual property is a set of human creations resulting from the mind intellect; these creations in short, serve to solve certain problems of society. In general, the current situation characterized by increased demand for creative solutions and cheaper access to new technologies and a greater volume resources, encourages innovation in the country. We live in a time for entrepreneurs and companies to develop new products and services and thus, grows the need to record the authorship of these goods and services (resulting from innovation)

In Kenya IPR are regulated by Kenya Institute of Property Rights(KIPI)approved by the country's relevant ministry In Mozambique it is also approved by a council of ministers.. With the entry into force of the Industrial Property Code of Mozambique, the National Industry Directorate under the Ministry of Industry and Trade, through the Central Department of Industrial Property-DCPI, initiated the management and protection of industrial property rights. The operationalization of the Intellectual Property Rights enforcement is consolidated with the creation Industrial Property Institute (IPI) by Decree. 50/2003 of 24 December the Council of Ministers of Mozambique

Intellectual property is divided into two major key parts including industrial property and the rights of authors.

Innovations can be protected by the following legal provisions which ensure that rights of innovators are upheld:

A patent

A patent is a grant of property right by a government/state to an inventor. It is issued by the commissioner of patent rights, and the most common type of patent is called a utility patent. All patent however, have the distinction of being assets with a commercial value because they provide exclusive rights of ownership the patent holders.

Patents are exclusive property rights that can be sold, transferred, or used as collateral much alike other valuable assets. The patent law stipulates broad categories of what can and cannot be patented and in the words of the statute any person who "invents or discovers any new and useful process, machine manufacture, or composition of matter, or a new and useful improvements thereof may obtain a patent".

Anything that is patentable must be new and useful (must have some demonstrated function and novelty)

The Nature of Patentable Inventions

Patents are classified according to

1. **Process** – The word process as used in patents refers to new methods of manufacturing or new technological procedures that can be validated as unique.
2. **Machine** – In patent law means that the patent application if for a specific physical item.
3. **Manufacture**- refers to physical items that have fabricated through new combinations of materials or technical applications.

The application must explain how the product is made including materials processes e.t.c.

4. **Composition of Matter**- this category is patent law relates to the chemical compounds such as synthetic materials, medicine, cosmetics etc

Types of Patents

Patent law provides for three categories of patents namely

- i) Utility patent
- ii) Design patent
- iii) Plant patent.

The utility patent

Utility patent is granted for new products processes, machines, methods of manufacturing and composition of matter. This category excludes, most botanical creations related to plant and agricultural use.

The design patents

These are patents granted for any new or original ornamental design for an article of manufacture. A design patent protects the appearance of an article and not the article itself.

The plant patents

In botanical terms any, new variety of plant that have been sexually reproduced can be granted a plant patent. The new plant must not exist in nature or in a raw state. Therefore new plants hybrids and seedlings may be patented.

Disclosures

The patent office provides an important service of limited protection through the invention disclosure programme. As a first step in seeking protection from the disclosure statement – the aim is to register an idea with the government. The inventor explains what the item is, that it is new and useful and how it is to be used copy is given or photograph. This gives the inventor protection as evidence of any legal tassel, or conflicting claims giving the inventor priority.

Trademarks

Trademarks include any word, name, symbol or distinguishing device or any combination thereof adopted and used by a manufacturer or merchant to identify his goods and distinguish them from those manufactured or sold by others.

Trade-marks can be names used in commerce such as KCA it can be a symbol or any distinguishing device artistic in nature. An important qualification for a trademark is that unique mark, name etc. must be used commercially.

Service mark

Is similar to trademark and can be registered in the same way with the same protection. A service mark can be a name, wording used in advertising symbols or artistic figures that create a distinctive service concept.

Copyrights

Copyrights are similar to patents in establishing ownership and protection for creative ideas but they apply to the intellectual property.

The copyright is distinct from patents and trademarks in that intellectual property is protected for the life of the originator plus a further 50 years. This protection affords an extraordinary property right and substantial estates. It extends protection to author, composers and artists.

Trade Secrets

Businesses have exclusive information used in the course of business to gain an advantage in manufacturing or commercialization of products or services.

Trade secret include:

- Formulas
- Patterns
- List of customers
- Data- bases
- Chemical compounds
- Combinations of ingredients for commercial products
- Process of manufacturing
- Compiled information.

Every organization must keep their secrets because

Modern communications systems contain so much information which if not guarded, the business may collapse.

Employees leaving may disseminate information to competitors.

To maintain a market Niche for a business, then desire to protect their product.

Trade Secrets

In certain instances the entrepreneur may prefer to maintain an idea or process as confidential, and eventually sell or license it as a trade secret.

The trade secret will have a life as long as the idea or process remains secret.

A trade secret is not covered by any law but is recognized under a governing body.

Employees involved in working with an idea or process may be asked to first sign a confidential information agreement that will protect against their giving out the trade secret either while as employees or when leaving the organization – this is called trade secret non -disclosure agreement.

Most entrepreneurs have limited resources so they choose not to find means of protecting their ideas or products or services.

Steps to be taken in order to maintain Secrecy in an Organization.

- a. Train employees to refer sensitive questions to designated personnel
- b. Provide proper security measures such as escorts to all visitors
- c. Avoid discussing business ideas in public places
- d. Keep important travel plans secret.
- e. Control information that might be presented by employees at conferences or published journals
- f. Use simple security measures such as locked file cabinets, passwords or computers, shredders e.t.c. Have employees and consultants sign non-disclosure agreements.
- g. Debrief departing employees on any confidential information.
- h. Avoid faxing any sensitive information
- i. Mark documents confidential when needed.

Note: Unfortunately protection against the leaking to trade secrets is difficult to enforce.

Licensing.

Licensing may be defined as an agreement between two parties, where one party has proprietary rights over some information, process or technology protected by a patent, trademark or copyright.

This arrangement specified in a contract requires the licence to pay royalty or some other specified sum to the holder of the proprietary rights in return for permission to copy the patent trademark or copyright.

Licensing has significance as a marketing strategy to holders of patents, trademarks or copyrights to grow their business in a new market when they lack resources or experiences in such markets.

It is also an important marketing strategy for entrepreneurs who wish to start a new venture but need permission to a copy or incorporate the patent trademark or copyright with the ideas.

Product Safety and Liability

Entrepreneur need to assess whether there is any product that is to be marketed in the new venture is subject to any regulations under the consumer product.

Apart from setting standards for products the commission has responsibility and power to identify what to consider as being a substantial hazard and barring any products that may be considered unsafe. All products introduced by entrepreneurs must obtain clearance from the Kenya bureau of standards under the consumers protection Act.

Activity Details

To perform this activity, you should access the website of the Institute of Industrial Property in Mozambique (www.ipi.gov.mz) and the websites of other countries with institute of property rights such as Kenya Institute of Property rights website.

The portal of the Institute of Industrial Property in Mozambique presents the vision, mission, values, agents and law on industrial property in the country. Visit link

“http://www.wipo.int/wipolex/en/text.jsp?file_id=202879” to access information on the Constitution of the Institute of Intellectual Property Cape Verde, where you can learn about the protection of intellectual property and the management of quality and intellectual property in that country.

Conclusion

Investing in technology is essential so that countries can innovate. Patenting is still lacking in many African countries, as in the case of Mozambique.

The intellectual property registration is beneficial to the industry (organization) Local and authors (individuals) and is a technological innovation indicator of the country, while it serves as a parameter for determining the standard of living of nations.

In Mozambique, for example, the technological innovation of patenting is under the jurisdiction of two organizations: the Ministry of Industry and Trade and the Ministry of Culture. This activity is developed in conjunction with the Ministry of Science and Technology and other ministries where the innovation originated.

The Institute of Industrial Property of Mozambique, as a national body that watches over intellectual property rights should have their coordinated actions with the World Intellectual Property Organization (WIPO), which in turn is managed by the United Nations (UN).

watch this video. https://www.youtube.com/watch?v=TqsD3A_VLFg

Evaluation

1. Draw up a descriptive and functional overview of Institute of Industrial Property of Kenya, Tanzania, Mozambique and your country, considering:
2. Nature, location and representations.
3. Services provided.
4. legal basis of technological innovation categories, intellectual property, copyright, patent registration.
5. Indicate actions to combat plagiarism by your country's organizations or with relationships with similar international organizations
6. Discuss how you can guard against leaking of your business secrets with regard to your innovations.

Activity 3.3 - technological innovation of products and rights

Intellectual Property

Introduction

One of the key elements in the protection of intellectual property is to give proper credit to intellectual property, ie a person cannot obtain credits / recognitions by the ideas and work of others.

When performing this activity, you will be discussing and reviewing content / issues on intellectual property in technological innovation in its relationship with professional ethics, copyright (copyright), patents, trade secrets, licensing agreements (agreements).

Activity Details

Based on this activity you will be faced with hypothetical situations and real which emerges rights issues of intellectual property in technological innovation of products. Will be presenting an exercise dealing with a case that is likely to negligence in the field of information and communication technologies.

Conclusion

The history of human civilization is related to the discoveries and innovations that resulted from the own creativity and intellect of man, conditioning the standard / quality of life of organizations and nations.

Depending on the current technological situation at the global level, it can be said that technological innovation is a key driver for the development of countries.

The management of intellectual property rights to the products of technological innovation is an important tool to promote competitiveness in the global market as a strong patent system determines the standard of living of a country and is also a technological innovation indicator (studied in unit 2).

The Right to intellectual property applied to technological innovation is very complex.

The intellectual property in technological product innovation is not simply the objects and their copies, but also on information and knowledge reflected in these objects and copies, and is therefore an intangible asset.

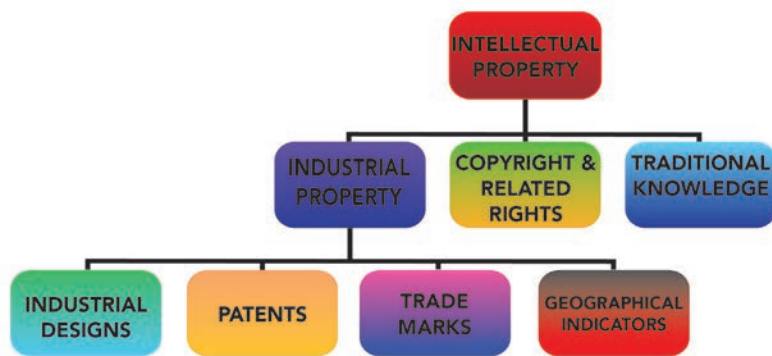


Figure 3: Examples of Intellectual Property Rights

Source: <https://www.jipo.gov.jm/?q=node/81>

Evaluation

Elvira is a talented programmer who heads the Applications Development Department for the sale of business solutions in Information and Communication Technologies. Realizing the complexity of the required application and there is a need to comply with the delivery of the product to the customer, she admits codes snippets of incorporation of other programs produced in your company and other companies and therefore may have a new application up and running and the customer is satisfied. However, Elvira does not inform the management company about this fact, but also no mention in the new program documentation.

Review this incident from the point of view of: 1) technological innovation and 2) intellectual property rights.

Unit Summary

The protection of intellectual property aims to support society, encouraging the development of new devices, the creation of new works of technological innovation that can improve the lives of the citizens of that society.

The author of the technological innovation work receives a reward materials by time and resources spent in its creation / invention, holding the right to commercially exploit the results of their production.

If the product of each could be easily copied and reproduced by others that would reduce the incentive to invention / creation and production of ideas that would generate technological innovation, long-term whole society loses.

The progress of humanity is still in shape, working out is about ideas, observations and results accumulated over time. Thus, the law on the protection of intellectual property resulting from technological innovation should not impede others to develop products with similar functions, provided they have sufficient information to characterize differentiation, improvement and innovation.

Unit Evaluation

Check your understanding!

Instructions

You should participate in the development of a reflective report on intellectual property rights in technological innovation of products. This activity should be developed in a group which shall be set out the level of participation of each element in the work credits.

Rating criteria

- (1) assessment of the average of the activities 1.1, 1.2, 1.3 - 50%
- (2) scientific article Development - 50%
- (3) General Unit Weight - 15%

Evaluation

The closure of this unit is the development of an abstract (scientific article) co-authored, two or three elements groups. You should participate in the development of a reflective report on intellectual property rights in technological innovation of products. Resume learning Unit 2 and the 1.3 activity of the current unit and submit in response to this task the tutor / teacher by email. The maximum length of the summary is 5 pages

Unit Readings and other resources

Readings and other required resources:

- Fernando Trias de Bes; Philip Kotler. The Bible Innovation - key principles to bring the culture of innovation organizations. Brazil - Sao Paulo: Text Editors Ltda. 2011
- Geciane Silveira Porto (ed.). Management of Innovation and Entrepreneurship. Brazil - Rio de Janeiro: Elsevier Editora Ltda. 2013
- The Tipping Point: How Little Things Can Make a Big Difference (Paperback) by Malcolm Gladwell

Readings and other optional Resources:

- www.ipi.gov.mz
- Constitution Of Kenya 2010
- Liability on the Internet and In Other Media. Enio Santarelli Zulianie et al. GV series LAW, São Paulo: Saraiva, 2007.
- The Innovative Solution: Creating and maintaining a successful growth (Hardcover) by Clayton M. Christensen
- Legal Aspects of Procurement Informatics and Telematics. Newton Lucca. São Paulo: Saraiva, 2003. [http](http://www.saraiva.com.br)
- Computer law. Liliana Minardi paesani. 6th ed, São Paulo: Atlas, 2007.
- http://pt.wikipedia.org/wiki/Direito_da_inform%C3%A1tica
- Legal aspects of the Internet. Gustavo Testa Correa. 3rd ed, São Paulo: Saraiva, 2007.
- http://www.portaldogoverno.gov.mz/Legisla/legisSectores/edu_leg/direitos_autores.pdf
- Civil responsibility. Carlos Roberto Gonçalves. 10th ed., São Paulo, Saraiva, 2007.

Unit 4. Case Studies

innovative and innovations (local context vs. Global Context); Study strategic management of the organization based on technological innovation projects

Introduction

As need and result of technological innovation, companies create services, processes and new or significantly improved products, leading in some cases to structural and functional changes of the organization / company.

In this unit you will have the opportunity to understand how the history of organizations can be influenced by the challenges and technological innovation results.

Unit Objectives

Upon completion of this unit, you should be able to:

1. Identify organizations (local and international) that have the technological innovation as a strategy for its development and its maintenance in the market.
2. Evaluate local initiatives that contribute to the improvement of living conditions of citizens and incubate innovation.
3. Identifying government initiatives that contribute to the creation of services and new or improved products.
4. Develop technological innovation projects that take into account the sustainability of resources.
5. Relate strategies of business management to technological innovation.

Key Terms

Strategy: Strategy can be defined as the determination of the goals and long-term basic objectives of a business and the adoption of action routes and placement of resources needed to achieve these goals. A well-formulated strategy helps you organize and allocate the resources of an organization in a unique and viable posture based on their skills and internal deficiencies related, anticipated changes in the environment and moves contingents by intelligent opponents.

Long-term perspective and commitment:

The innovation process requires time and persistence of the organization.

Assessment of external and internal

environment: One innovation is given in relation to competitors and customers.

Setting objectives and targets: Innovation may be the only means to achieve certain goals and market goals.

Continuous evaluation: The process of creating innovation can be evaluated with standard indicators, coming from quality control.

Strategic alliance: A strategic alliance is when two or more companies join targeting long-term goals

Learning activities

Activity 4.1 - Innovators And Innovations From Case Studies: Global Context

Introduction

Bes and Kotler (2011) propose a list of innovative companies based on the good results they achieved and the relationship between time and resources invested in innovation, they are Apple, Google, Netflix, IBM, BMW, General Electric, Toyota, Microsoft, Ericsson, Nokia, ...

According to Forbes, the list of the 10 most innovative companies in the world includes: 1 - Salesforce.com (United States), 2 - Alexion Pharmaceuticals (USA), 3rd - VMware (United States), 4 - Regeneron Pharmaceuticals (United States) , 5 - Arm Holdings (UK), 6 - Baidu (China), 7 - Amazon.com (United States), 8 - Intuitive Surgical (United States), 9 - Rakuten (Japan), 10 - Natura (Brazil).

Watch this video for more illustration. <https://www.youtube.com/watch?v=ckY4TZmgyOg>

Details of the activity

For this activity, you will research apply their knowledge developed in the previous units and reflect on how the economic-political and social differences influence the scientific level of development and technological innovation of nations. The readings and other features of this unit are the readings and other features section, provided at the end of the unit.

Conclusion

The ranking of the most innovative companies in the world can be drawn from the evaluation of the market value of each company based on expectations of future innovative results; new products, services and markets.

Each organization conducting the ranking of the most innovative companies in the world use metrics / indicators that can generate different results from other similar organizations and audit rating, therefore you may need to consider what metrics are adopted by your country and those that are internationally accepted

Activity 4.2 - Innovative and Innovations

Resume ranking list of the most innovative companies in the world.

Review the predominance of American companies in the top position considering the economic crisis in these countries and the poor representation of African countries and technological development levels of their countries. List the national companies that carry out the audit in organizations dealing with technological innovation?

Apple is a company in the sector of information technologies that contribute to the provision of mobile technologies worldwide. It presents an Apple trajectory synthesis with regard to technological innovation.

Activity Details

In this activity, you must work as a team with his colleague, collaborating in the design of a digital inclusion project with young people from regions with limited resources access to technology, without power and several other barriers, but enthusiasts to participate in the development of its region.

The readings and other features of this unit are the readings and other features section, provided at the end of the unit.

Conclusion

Progress of humanity is still in shape, working out is about ideas, observations and results accumulated over time. If African countries do not occupy prominent places in the rankings of companies with indices of technological innovation high on a global level, the scenario only tends to insecurity when it comes to the local context, characterized by regional development disparities and access to technology. development agendas are challenged to contemplate policies that enhance food security and alleviation of social and economic differences, while they stimulate activities and investigations that produce technological innovation in these contexts.

Evaluation

1. In groups of two students, create a project for teaching web programming for children of a community within the country and who do not have electricity.
2. Consider possibility of using car mini-bus type,
3. Also consider use of alternative energy sources.

Mapping innovation indicators,

Approach of local development issues, entrepreneurship / innovation.

Present an overview of the trajectory of an innovative company in its region, based on the technological innovation and mentioning the reasons for choosing this company.

Activity 4.3 - Study Strategic Management Of Organization-Based Technological Innovation Projects

Introduction

Funds represent a challenge in the initial phase much innovation projects undertaken by entrepreneurs and companies. Aware of the contribution of innovation initiatives in raising the technical-scientific and social capital of individuals and organizations, many countries have articulated efforts to facilitate financing activities that generate income for their citizens, while innovate in products and services.

In Kenya a lot of interventions have gone a long way in creating funds to start entrepreneurial ventures. For example the Youth development fund was started in 2006 and women development fund in 2007. However, it is worth noting that a big majority of the youths and women in Kenya(80%) have not accessed such funds either due to ignorance or non-compliance with accessibility procedures.

In the case of Mozambique, in order to finance measures to encourage the entrepreneurial poor, generation of employment income and innovation, was created in 2005, the Investment Fund for Local Initiatives (FIIL) that, as a budget allocation in the district receives designation of Local Initiative Investment Budget (OIIL), which was transformed into District Development Fund (FDD) by No. 90/2009 decree.

Activity Details

In this activity, you are invited to make a proposal to visualize the possibility of incubating technology innovation projects from governmental initiatives providing economic resources in the districts and their deployment in actions that increase the production, productivity, creating jobs and entrepreneurs with impact on local and regional development.

The readings and other features of this unit are the readings and other resources section, provided at the end of the unit.

Conclusion

The history of the development of science and technology is full of many examples of accidental successes. This principle of accidental invention does not apply to technological innovation, which requires continuous effort and complex to develop significant new products and services that sustain the market or create other market fronts; innovation generating innovations.

Evaluation

The Investment Fund for Local Initiatives (FILL) in Mozambique, commonly known as “7 million” is one of the local development promotion strategy for poverty reduction.

Explain how the Investment Budget to Local Initiatives (OILL) can contribute to the production and technological innovation?

Unit Summary

Innovation needs a strategy and serves the management of the organization the ability to visualize new ways of being front organization to its competitors, customers and the dynamics associated with these changes.

Decisions on innovation strategy in the company require the evaluation of internal and external environment in order to take full advantage of the most important aspects for decision making.

In the process of strategic management of the organization based on innovation projects, companies invest in training their staff / employees at all levels and sectors (R & D, marketing, human resources, production managers) to better prepare for the challenges of the process innovation.

Unit Evaluation

Check your understanding!

Unit 4 Rating

You should work with a colleague in the preparation, presentation and defense of the draft Discipline Project (instructions "review"). This activity summarizes the lessons learned on innovative, technology management and innovation strategies.

Instructions

this unit evaluation criteria are two:

Evaluation of the active, and keeps reading the materials proposed for the unit. It will be observed from the answers in activities 1.1, 1.2, 1.3 of this unit.

Presentation and defense of the Course Project in two students (evaluation of Unit 4). This This presentation and defense together provide an opportunity to deepen their knowledge on technological innovation and serve as a test for you to take the examination of the course with greater competence and tranquility that can give you academic success.

Rating criteria

This unit has 15 weight percentage (%) of the overall evaluation module. But follow the following distribution for the activities in Unit 4.

- (1) Activity 1.1 - 20%
- (2) Activity 1.2 - 20%
- (3) Activity 1.3 - 20%
- (4) Evaluation Unit 4-40%

Evaluation

Discipline Project: As a group of two students, prepare a groundwater catchment project to supply drinking water to the population of a district that does not have electricity.

Consider: 1) Ability to use the District Development Fund (FDD), 2) use of alternative energy sources, 3) Mapping innovation indicators.

Required Readings and other resources:

- Fernando Trias de Bes; Philip Kotler. The Bible Innovation - key principles to bring the culture of innovation organizations. Brazil - Sao Paulo: Text Editors Ltda. 2011
- Making Ideas Happen: Overcoming the barriers between vision and reality (Hardcover) by Scott Branson
- Geciane Silveira Porto (ed.). Management of Innovation and Entrepreneurship. Brazil - Rio de Janeiro: Elsevier Editora Ltda. 2013

Readings and other optional Resources:

- The Art of Innovation: Creativity Lessons from IDEO, a leading design company in America (Hardcover) by Tom Kelley (it was named 25 times as innovation)
- Forbes - <http://infograficos.oglobo.globo.com/emprego/as-10-empresas-mais-inovadoras-do-mundo.html>.
- Robert K Yin: Case Study Methods. COSMOS Corporation. 2004. Available at: <http://www.cosmoscorp.com/Docs/AERAdraft.pdf>
- The Innovative Solution: Creating and maintaining a successful growth (Hardcover) by Clayton M. Christensen
- The Tipping Point: How Little Things Can Make a Big Difference (Paperback) by Malcolm Gladwell.

Unit Summary

The focus of technological innovation is the increased productivity, relating everything that happens on the border of knowledge and generating innovation through research and investments in automation and emerging technologies and thus, increasing the efficiency and effectiveness of related services or products to that innovation.

There is no doubt that technological innovation has received much importance in the contemporary technological moment, being imputed to it all the success and challenges of the new social order. For example, if on the one hand technological innovation brings benefits to society by creating opportunities for creating new jobs, on the other hand, it is responsible for the extinction of many other jobs.

There is a growing demand for workers with skills in digital technologies, especially those specializing in information and communication technologies in the areas of computer networks, programming and systems analysis.

In this sense, and considering that the process of change is very present in all areas of society, it is necessary that education, political and economic institutions are prepared to follow the increasingly rapid advances in technology through partnerships and services integrated system that promote wellness.

However, it should be noted that technological innovation should not serve only to create new products and services or improved goods and services from the ones existing but also to drive changes in the way of conceiving and doing things. For this reason it is important to pay attention to indicators of innovation and the development of global innovation strategies and technological innovation in all productive sectors of a given society

Unit Evaluation

Final inspection of Technological Innovation Module

Instructions

Having reached the end of the study of the four units of the Technological Innovation Module, it is time to make up the assessment of the relative technological innovation learning and its implications for the organization's management and its success as well as their partners.

Based on the contents studied in units 1, 2, 3 and 4 of this module you are asked to perform the final evaluation of the course. This assessment consists of the presentation and defense of the final version and individual Discipline Project from the activity (project) held in groups in Unit 4.

Rating criteria

The overall assessment of the course will be obtained by the algebraic sum of the assessments in units 1, 2, 3 and 4 the final assessment (examination) of the course. The examination is about to perform has the weight of 50% in the overall evaluation of the module, and the units that precede are the weights distributed as follows:

Unit 1 - 10%

Unit 2 - 10%

Unit 3 - 15%

Unit 4 - 15%

Evaluation

individual course final project: Based on the group project designed to evaluate the Unit 4, taking into account the recommendations of the teacher / tutor on individual referrals and improvements / suggested corrections, prepare a groundwater catchment project to supply drinking water for the population of a district that does not have electricity.

Consider: 1) Ability to use the District Development Fund (FDD), 2) use of alternative energy sources, 3) Mapping innovation indicators, 4) Explanation of changes and specialization adopted by you and your colleague

Module/Course Summary

This course gives a discussion on Technology innovation with regard to production of goods and services through creativity, research and investments in automation and emerging technologies and thus, increasing the efficiency and effectiveness of related services or products to that innovation. The importance of Technology innovations is well captured in unit 1 which explains the ability to creation and placement of new products or consumer acceptance services market able to provide conditions of profitability the company and individuals. The module also identifies innovation sources as either internal or external E.g. a research and development sector (R & D), marketing sector and other internal or external organization entities. Innovation is always a process that requires taking on challenges at any given time, your results may be satisfactory or not.. An organization that does not innovate is in serious danger of losing its place for the competitors in the industry in the market. Individuals and organizations innovate wherever possible to adapt to the reality of the moment and the global market.

Technological innovations transforms businesses and society by creating opportunities for creating new jobs, on the other hand, it is responsible for the extinction of many other jobs.

Various technological innovation models and case analysis are suggested in this module in unit 3 and 4 respectively which can aid in improving business performance.

Course References

- Jerome Mendes. The Entrepreneur's Handbook - How to Build a Successful Business. 2nd ed . Brazil - Sao Paulo: Editora Atlas SA 2015
- Fernando Trias de Bes ; Philip Kotler . The Bible Innovation - key principles to bring the culture of innovation organizations . Brazil - Sao Paulo: Text Editors Ltda . 2011
- Geciane Silveira Porto (ed.) . Management of Innovation and Entrepreneurship . Brazil - Rio de Janeiro : Elsevier EditoraLtda . 2013
- <https://www.youtube.com/watch?v=ckY4TZmgyOg>

FINAL EXAMINATION

TECHNOLOGY AND INNOVATION

UNIT CODE US 20

TIME 30 HOURS

INSTRUCTIONS: COMPLETE THE PROJECT

This will be the Final inspection of Technological Innovation Module

Having reached the end of the study of the four units of the Technological Innovation Module, it is time to make up the assessment of the relative technological innovation learning and its implications for the organization's management and its success as well as their partners.

Based on the contents studied in units 1, 2, 3 and 4 of this module you are asked to perform the final evaluation of the course. This assessment consists of the presentation and defense of the final version and individual Discipline Project from the activity (project) held in groups in Unit 4.

Evaluation Test

individual course final project: Based on the group project designed to evaluate the Unit 4, taking into account the recommendations of the teacher / tutor on individual referrals and improvements / suggested corrections, prepare a groundwater catchment project to supply drinking water for the population of a district that does not have electricity.

Consider: 1) Ability to use the Various development Funds, 2) use of alternative energy sources, 3) Mapping innovation indicators, 4) Explanation of changes and specialization adopted by you and your colleague.

Rating criteria

The overall assessment of the course will be obtained by the algebraic sum of the assessments in units 1, 2, 3 and 4 the final assessment (examination) of the course. The examination is about to perform has the weight of 50% in the overall evaluation of the module, and the units that precede are the weights distributed as follows:

- Unit 1 - 10%
- Unit 2 - 10%
- Unit 3 - 15%
- Unit 4 - 15%

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