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Editorial

Science and technology is rapidly progressing day by day and some new dimensions have been added in last few decades like nanotechnology, artificial intelligence, green chemistry, organic superconductivity, etc. Only sky is the limit for the growth of these subjects and it all depends on the requirements of the society in general and we people, in particular. It is therefore necessary for the younger generation to keep abreast with the frontiers of these ever growing disciplines. Sometimes, many novel ideas may not draw the attention of senior scientists although these may be quite important and applicable in future and therefore, they find it difficult to get published in time. Pacific university has planned to provide a desired platform for such ideas also. In this context, Pacific University has taken a step ahead by instituting a half-yearly journal "Pacific University Journal of Science & Technology" from this very year so that young budding as well as established scientists and technologists can publish their interesting research findings and share it with others in their respective fields throughout the globe. Articles on any front line area of science and technology are always welcome by the editorial board.

With Regards,

Prof. Suresh Chandra Ameta

Editor

Health Management of People Affected by Some Poisonous Animals in India

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Abstract

Human health is affected by various physical, chemical, biological, environmental, psychological and various other factors. With regard to this topic, we shall discuss biological factors that affect human health. An animal that is poisonous or venomous or possess venomous stings that adversely affect health of well being. Animals such as snake, scorpions, spiders, ants, jelly fish, lizards, bee, wasps, caterpillars, toads and various others are poisonous to human beings. They attack or bite human beings only as a part of their defense mechanism to protect themselves, resulting; they cause serious envenoming in men. The study has been done on the various animals of phyla arthropoda; chordata and cnidaria as majority of Indians are affected by animals of these phyla. Their toxins or poisons/venom are constituted of diverse chemical substances that may be neurotoxic or cytotoxic or hemotoxic to our body. They impair the proper functioning of tissues, muscles and various other internal organs and systems.

Keywords: Snake, Scorpion, Envenomation, Lizard

Introduction

Health is the product of its functional and (or) metabolic effectiveness of a living organism. In humans, it is the common states of a person in his mindset, physical appearance and soul, habitually meaning to be free from sickness, injury or soreness. World Health Organization (WHO) defined health as "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity." Health is not just a state, but also "a resource for everyday

life, not the objective of living. Health is a positive concept emphasizing social and personal resources, as well as physical capacities." [1, 2]

Objective of Study

1. To describe the contents and chemical composition of different kinds of poisons/venom in different animals like snake, scorpion, jelly fish, lonomia moth, bee, wasp and lizard.
2. To study the effects of poisons/venom on human body.
3. To familiarize about the first aid treatment to be given to a poison affected person.
4. To study in detail the various allopathic, ayurvedic, homeopathic and traditional methods of treatment when a human body is affected by these poisons/venoms/toxins [3, 4].

List of Poisonous Animals

1. Arachnids –

(A) Spiders :

- Australian funnel web spider
- Black widow spider
- Brazilian wandering spider
- Brown recluse spider

(B) Scorpions

(C) Caterpillars:

- Lonomia moth

2. Cnidaria –

- Jelly fish • Portuguese man o'war

3. Amphibians –

(A) Frogs :

- Poison dart frog • Corroboree frog
- Colorado river toad • Cane toad

(B) Salamanders –

- Pacific newts

4. Insects –

- Bees • Wasps • Ants

5. Fishes –

- Stone fish • Lion fish • Scorpion fish
- Stargazer • Toad fish • Sting rays

6. Reptiles –

(A) Snakes :

- Boomslang • Cobra

(B) Lizards :

- Gila monster • Mexican beaded lizard
- Komodo dragon

7. Mammals –

- Male platypus • Cuban solenodon
- European mole

8. Cephalopods –

- Blue ringed octopus
- Pfeffer's flamboyant cuttlefish [5 – 9]

A. Snake (king Cobra)

Genus - Ophiophagus

Genus - Ophiophagus

Species - Hannah

Common Indian names - naga, phanin, sarp, saanp (Figure 1)

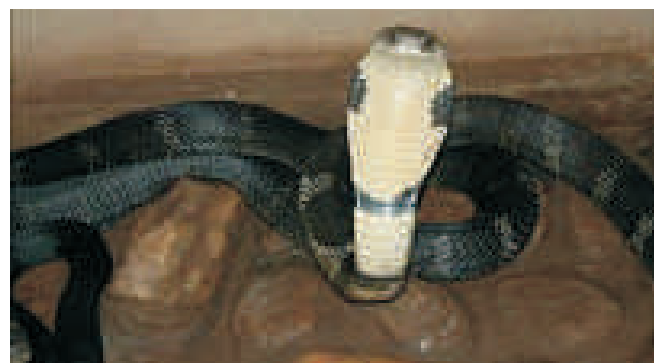


Figure 1 : Snake (King Cobra)

Snake venom

Snake venom is exceptionally adjusted spit that is created by extraordinary organs of specific types of snakes. The organ which secretes the zootoxin is an adjustment of the parotid salivary organ of different vertebrates and is normally arranged on either side of

the head underneath and behind the eye, put resources into a solid sheath. Snake venom is a blend of a wide range of proteins and catalysts. A large number of these proteins are safe to people, yet some are poisons.

Chemistry and physiology of snake venom

Snake venom consists of proteins, enzymes, substances with a cytotoxic effect, neurotoxins and coagulants [10, 11, 12].

1. Phosphodiesterases are used to interfere with the prey's cardiac system, mainly to lower the blood pressure.
2. Phospholipase A2 causes hemolysis.
3. Snake venom represses cholinesterase to influence the prey to lose muscle control.
4. Hyaluronidase builds tissue porousness to expand the rate that different chemicals are assimilated into the prey's tissues.
5. Amino corrosive oxidases and proteases are utilized for assimilation. Amino corrosive oxidase likewise triggers some different catalysts and is in charge of the yellow shade of the venom of a few animal categories.
6. Snake venom frequently contains ATPase, a catalyst which catalyzes the hydrolysis of ATP to ADP and a free phosphate particle, or to AMP and diphosphate.
7. Acetylcholine receptors are blocked by cobra venom [13, 14].

Effect of snake venom

There are four distinct types of venom that act on the body differently.

- Proteolytic venom - It take apart the molecular structure of surrounding and including the bite area.
- Hemotoxic venoms - It affects the heart and cardiovascular system.
- Neurotoxic venom – It affects the nervous system and brain.
- Cytotoxic venom – It affects only the site of

the bite.

The nibble is quickly trailed by nearby torment of a copying character; the appendage soon swells and progresses toward becoming stained, and inside one to three hours extraordinary surrender, joined by heaving, and regularly loose bowels, sets in. icy, damp sweat is regular. The beat turns out to be greatly weak, and slight dyspnoea and eagerness might be seen. In serious cases, which happen generally in youngsters, the beat may end up plainly subtle and the limits icy; the patient may go into trance like state. Snake venom acts more on the vascular framework, achieving coagulation of the blood and thickening of the aspiratory corridors.

Early side effects incorporate cerebral pain, sickness, the runs, laziness, mental bewilderment, wounding and seeping at the site and all body openings; and one could bite the dust from a mind discharge and respiratory crumple.

Snake bite treatment

First aid treatment

- Wash the wound with large amounts of soap and water.
- Inspect the wound for broken teeth or dirt.
- Get away from the snake to prevent a second bite or a second victim.
- Safely and rapidly transport the victim to an emergency medical facility unless the snake has positively been identified as harmless.
- Remove constricting items on the victim such as rings or other jewellery, which could cut off blood flow if the bite area swells.
- Do not cut and suck, or use ice, alcohol and electric shock.
- If you are in a remote area in which transport to an emergency medical facility will be prolonged, you should apply a splint to the affected limb. If you do apply a splint, remember to check periodically to ensure that it is not cutting off blood flow.
- “The affected limb should be used as little as

possible to delay absorption of the venom [15].”

Drug treatment

1. A tetanus shot is required if the victim has not had one within five years. Some wounds may require antibiotics to prevent infection.
2. Cobra venom has a curare like neurotoxin. Neostigmine + atropine prevent respiratory paralysis.
3. “Pre-treatment with a non-sedating anti-histamine (i.e., promethazine 0.25 mg/kg), subcutaneous adrenaline (0.25mg for adults, 0.01mg/kg for children), and i.v. steroids (hydrocortisone 2 mg/kg) is still recommended [15, 16].”

4. Snake bite products-

- Gymnema extract

Supplier: Changsha Huir Biological-Tech Co., Ltd., China

- Aristolochia indica extract

Supplier: Oceanic Pharmachem Pvt. Ltd., India

- Green salve

Supplier: Otter & Trout Trading Co. Inc., Indonesia

- Golden buckwheat extract

Supplier: Xi'an Erica Botanical Products Co., Ltd., China

- Airpotato yam

Supplier: Fuyang Green Foods Co., Ltd., China

- Glucosamine sulfate sodium chloride

Supplier: Qingdao Yuanrun Chemical Co., Ltd., China

- Snake anti-venin
(polyvalent drug 10ml vial)

Supplier: Biologica E Ltd., India

- Morinda root extract

Supplier: Shaanxi Sciphar Hi-Tech Industry Co., Ltd., China

Ayurvedic Treatment

- Root of Sindhuvara macerated in its own

juice added with honey and consumed as a recipe.

- Each part of Sungandha, Draksha, Svetakhyaya, Gajakrnika, half parts of each of leaves of Saurasa, Kapittha, Bilva, Dadima made into paste mixed with honey and used as antidote.
- If bitten by black cobra the blood should be removed from the site and paste of Carati and Nakuli or powerful root poison should be applied.
- Kushta with honey is used as nasal drops.
- Antidote prepared out of Tanduluyaka, Kasmarya, Kinhi, Girikarnika, Matulunga, Sita selu used for drinking nasal medication and collyrium.
- If you're fresh out of lizard bite, make a poultice from two crushed onions mixed with a few drops of kerosene, and apply it to the bite. After a short time, it should draw out the poison, turning the poultice green.
- “Mix a wad of tobacco with saliva or water. Apply this paste directly on the bite [15, 16].”

Snake anti-venoms

Anti-venom (or anti-venin or anti-venene) is an organic item utilized as a part of the treatment of venomous chomps or stings. Antidote venom is made by draining venom from the coveted creature (like snake, creepy crawly or a bug). The venom is then weakened and infused into a steed, sheep, goat or feline. The subject creature will experience a safe reaction to the venom delivering antibodies against the venom's dynamic atom which would then be able to be gathered from the creature's blood and used to treat envenomation.

Antivenoms are administered as injectable [17, 18]. Some of the available antivenoms have been listed below:

- Polyvalent snake anti-venom inj.
- Polyvalent snake anti-venom inj.
- Death adder anti-venom inj.

- Taipan anti-venom
- Black snake anti-venom inj.
- Polyvalent snake anti-venom inj.
- Vipera tab
- Polyvalent crotalid anti-venin inj.
- Soro antitropocrotalico inj.
- SAIMR polyvalent anti-venom inj.

Traditional treatment

Plants used to treat snake bites are made into tinctures with alcohol or olive oil and kept in rum flasks called snake-bottles. Snake bottles contain several different plants and/ or insects. The plants used include the vine called monkey ladder (*Bauhinia cumanensis* or *Bauhinia excise*, Fabaceae) is pounded and put on the bite. Alternatively, a tincture is made with a piece of the vine and kept in a snake-bottle.

Other plants used include: mat root (*Aristolochia rugosa*), cat's claw (*Pithecolobium unguis-cati*), tobacco (*Nicotiano tobacum*), snake bush (*Barleria lupulina*), Obie seed (*Cola nitida*), and wild gri root (*Acrocomia ierensis*).

Another native plant used is mardi gras (*Renealmia alpinia*) (berries), which are crushed together with the juice of wild cane (*Costus scaber*) and given to the bitten.

Quick fixes have included applying chewed tobacco from cigarettes, cigars or pipes as well. Making cuts around the puncture or sucking out the venom has also been helpful.

Homeopathic treatment

- Lachesis: One of the most common and effective homeopathic remedies for snake bite and bites from poisonous insects is Lachesis. The remedy is indicated when the skin is purple-bluish or mottled in color. This homeopathic remedy comes from the poisonous venom of the bushmaster snake. Lachesis mutus has potent effects on the blood and central nervous system.
- Bromelain and papain: The snake venom

molecule (and most snake and insect bite venoms) are composed of three-dimensional, nearly 100% pure, protein. The strongest known natural solvents for protein molecules are bromelain and papain. Bromelain is found in pineapple. And papain is present in papaya fruit.

- "Ammonia Carb 1M in frequent doses is said to be very useful in these cases. Apply Cedron Q or Sisyricnium Q locally on the wound [17]."
- For fainting due to snakebite use Acid Hydrocyanic 30C or higher in frequent doses.
- If the species of the snake is known the following medicines can be used:
 - Cobra: Ammonia Carb 1M, Acid Hydrocyanic 30C or higher
 - Rattle Snake: Crotalus Hor 30C, 1M, Plantago Q, 1M
 - Viper: Camphor Q

B. Indian Red Scorpion

Genus - Hottentotta

Species - tumulus

Common Indian names - bichhoo, vrushchika (Figure 2)



Figure 2 : Indian Red Scorpion

Description

"It is a cunning killer that lives in the desert places, hiding under natural burrows and stones. This deadly

scorpion waits patiently for its victims to pass by before striking an attack. The scorpion's venom is packed with lethal enzymes, enzyme inhibitors, histamines and neurotoxins that enter the victim's brain to attack nervous tissue. One of the key players is called chlorotoxin. From earthworms, crickets and even humans the immediate stroke of its tail delivers a poisonous punch [19]."

"The scorpion's sting releases a venomous cocktail that can lead to cardiac and respiratory complications and death in humans, especially in children. Ironically, researchers believe scorpion's venom also holds the key to save lives. Many studies have shown that by itself chlorotoxin does not cause harmful effects in mice or humans [20]."

Scorpion venom

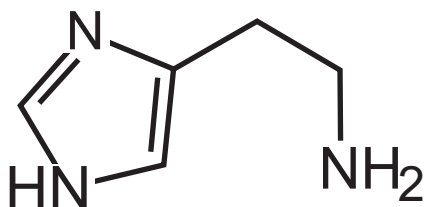
The scorpion's venom is composed of a variety of compounds [21]. The venom from a single scorpion may include –

- (a) Neurotoxins
- (b) Histamine
- (c) Serotonin
- (d) Enzymes
- (e) Enzyme inhibitors
- (f) Other unidentified compounds.

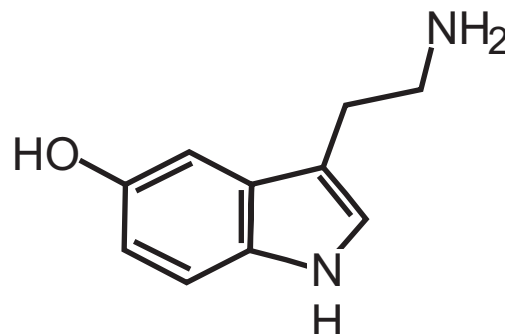
The venom may also contain mucous, various salts, peptides, nucleotides and amino acids. Some neurotoxins may have greatest activity against insects, others may be most lethal to mollusks, and still others may target mammalian nerve cells.

Chemistry and physiology of scorpion venom

1. The venom of some scorpions has been found to contain phospholipase A, an enzyme and histamine, which dilates blood vessels



2. Serotonin, which causes constriction of blood vessels in mammals, is also produced by some scorpions and has been suggested as a pain-producing compound.



Serotonin in scorpion's venom induces uterine contractions and causes spontaneous abortions in rats. It is responsible for spontaneous abortions in women who are stung by scorpions in their first trimester.

"Scorpion's venom is highly cytotoxic. Inflammation and induration at the site of the sting may be followed by necrosis and sloughing of the skin. Large blisters may also develop. The target of the scorpion's neurotoxin is the victim's excitable cells, primarily nerve cells. The neurotoxins specifically target the voltage dependent sodium and potassium ion channels on the nerve cell's membrane. This action leads to an alteration of the nerve cell's firing pattern and an accumulation of sodium or calcium ions within the cell. The end result is a release of neurotransmitters from the affected tissues [21]."

In vertebrates, the systemic effects observed after envenomation are probably the result of the release of massive quantities of catecholamines from the victim's adrenal glands. Instead, the neurotoxins induce the victim's own chemical communication system to destroy the victim's homeostatic functions.

Signs and symptoms of scorpion envenomation

Envenomations are usually categorized into two or three levels of severity:

1. Localized effects
2. Systemic effects

3. Systemic effects with central nervous system involved.

Localized effects – “are common to nearly all scorpion stings regardless of the toxicity of the venom. These symptoms are restricted to the site of sting and include intense pain, minor swelling, redness or induration, numbness, tenderness, and tingling. Intense pain normally subsides within one hour, giving way to numbness, tenderness, and tingling at the site of sting [20, 21].”

Systemic effects – “The following signs and symptoms are often reported: intense pain that radiates towards the body and is especially acute at the armpits and groin areas, agitation or anxiety, increased body temperature, sweating, chills, a feeling of numbness or swelling of the face, tongue and throat, pain or tightness in the chest or back, and occasionally slightly increased heart rate and blood pressure. The victim is normally very anxious.”

Systemic effects with CNS involvement – “are signs of severe envenomation. Such severe systemic involvement appears to be the result of massive release of catecholamines by the victim’s adrenal glands. Any of the following signs or symptoms is cause for concern: fever, excessive salivation, involuntary tearing, nausea or vomiting, confusion, coma, convulsions, increased or decreased heart rate or blood pressure, increased or involuntary defecation or urination, increased fluid excretion into the bronchioles and lungs, or swelling of the lungs. Death is usually due to heart or respiratory failure.”

Scorpion sting treatment

First aid treatment

- Remain calm and try to relax.
- Clean the site with soap and water.
- Elevate the affected limb to approximately heart level.
- An analgesic as needed for minor discomfort.
- Oral anti-histamines may be given to help relieve the pain from the sting.

Scorpion sting anti-venom

Scorpion anti-venoms have been used in the treatment of scorpion envenomation for a long time. They definitely reduce the mortality rate from scorpion envenomations. Ismail (1995) suggested that anti-venoms produced from crude venom are much less effective than anti-venoms from purified venom. These include:

- Alacramyn inj.
- Suero antialacran inj.
- Anti-scorpion venom serum I.P.
- Scorpion antivenom
- Purified polyvalent anti-scorpion serum (equine).
- SAIMR scorpion anti-venom

Drug treatment

The following drugs have been found to be effective in the treatment and management of scorpion sting [22].

- Beta blocker
- Calcium channel blocker
- Atropine
- Diuretics
- Steroids
- Antihistamines
- Lytic cocktail
- Insulin & glucose
- Captopril

- A. **Prazosin:** “It is a pharmacological and physiological antidote to the venom action. It is a post adrenergic receptor blocker and has thousand fold more affinity to alpha1 receptors. It reduces preload and left ventricular load, without raising the heart rate and rennin secretion. As a potent

phosphodiesterase inhibitor, it increases cGMP in vascular endothelium and myocardium and inhibits the formation of inositol tri phosphate. It also activates calcium dependent potassium channels inhibited by the venom. It enhances insulin secretion. In India since the advent of prazosin the fatality due to severe scorpion sting is reduced to less than 1 percent. It also helps to combat the anoxic myocardium similar to glucose and insulin and potassium drip [23].”

B. “*Dobutamine drip* (8-11mcg/kg/min) over 12-36 hrs [24, 25].”

C. “*Intravenous sodium nitroprusside* (3-5mcg/kg/min) [26].”

Ayurvedic treatment

“Mango tree leaf can be used as a effective herbal cure

C. Insects

(I) WASP

Genus-Ophion

Species-luteus

Common Indian names - tataiya, barre, bhid (Figure 3)

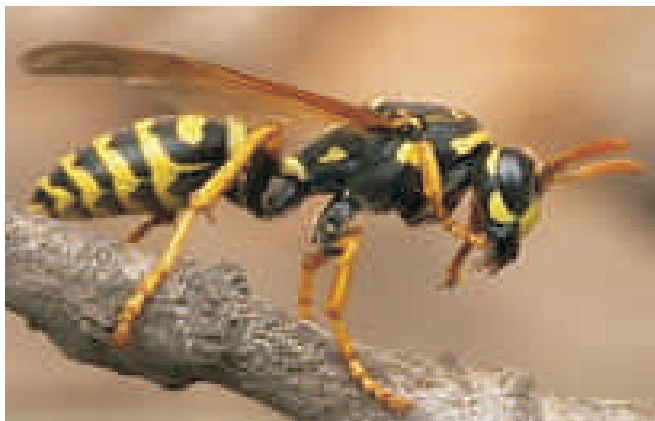


Figure 3 : Indian Wasp

Wasp venom (chemistry & physiology)

“Wasp venom contains upto 13 different antigens. The wasp sting first, causes an intense stinging sensation that is believed to be mediated by the

presence of ach and serotonin, which make upto 5% of the dry weight of the venom. The ach causes an intense depolarization of the nociceptors within the dermis. The serotonin causes multiple effects through the 5-HT receptors, including an intense localized vascular spasm [32].”

In addition, the wasp venom also contains phospholipase A, phospholipase B, as well as mastoparan peptide, which can cause direct mass cell de granulation with the release of histamine. The resultant localized ischemia increases the inflammatory response with subsequent vasodilation. This produces increased capillary permeability and localized swelling and redness at the site of the wasp sting.

(II) Honey Bee

Genus - Apis

Species - cerana

Common Indian name - madhumakhi (Figure 4)

Honey bee stings



Figure 4 : Honey bee

“A honey bee, which is away from the hive, foraging for nectar or pollen will rarely sting, except when stepped on or roughly handled. Honey bees will actively seek out and sting when they perceive the hive to be threatened, often being alerted to this by the release of attack pheromones [33].”

“Although it is widely believed that a worker honey bee can sting only once, this is a partial misconception; although the stinger is in fact barbed so that it lodges in the victim’s skin, tearing loose from

the bee's abdomen and leading to its death in minutes. The bee's sting is speculated to have evolved for inter-bee combat between members of different hives, and the barbs serve to improve penetration of the chitinous plates of another insect's exoskeleton. Honey bees are the only hymenoptera with a strongly barbed sting [34]."

The sting's injection of apitoxin into the victim is accompanied by the release of alarm pheromones, a process which is accelerated if the bee is fatally injured. Release of alarm pheromones near a hive or swarm may attract other bees to the location. These pheromones do not dissipate or wash off quickly, and if their target enters water, bees will resume their attack as soon as it leaves the water.

The larger drone bees do not have stings. In worker bees, the sting is a modified ovipositor. The queen bee has a smooth sting, but her sting is not for defense of the hive.

Chemistry of bee sting

"The main component of bee venom responsible for pain in vertebrates is the toxin melittin (highly acidic peptide); histamine and other biogenic amines may also contribute to pain and itching. In one of the medical uses of honey bee products, apitherapy, bee venom has been used to treat arthritis and other painful conditions [35,36]."

Signs and symptoms of wasp and honey bee sting

- Urticaria which has also been termed "anaphylaxis of the skin" typically presents as raised pruritic erythematous wheals, urticaria develops because of the presence of activated mast cells in the connective tissue of the dermis with the production of chemical mediators such as histamine that increase local vascular permeability
- Systemic symptoms include nausea, vomiting, abdominal cramping, and diarrhea due to mast cell activation in the GI tract. Coughing, dyspnoea and wheezing can occur after mast cell activation in the airway.
- Anaphylactic shock is an immediate type hyper sensitivity reaction that occurs when mast cells are activated within multiple organ systems and vascular collapse occurs. This is an IgE mediated reaction with the sting
- A localized reaction causes the symptoms of redness, swelling and pain over the site of the wasp sting. The pain begins immediately and gradually worsens as the redness and edema gradually worsen. The localized reaction may last 6-12 hrs
- A patient with a mild allergic reaction may experience itching and hives
- "Severe allergic reactions and anaphylaxis may present in patient as symptoms offer throat closing sensation, dyspnoea, chest tightness, light headedness, increased anxiety, headache, nausea, abdominal cramps and palpitations [37]."

Wasp and honey bee sting prevention

- To prevent a sting on feet, wear shoes when outside and strolling on grass.
- Avoid bloom greenery enclosures, plantations, or wherever wasps and honey bees will probably dwell.
- Wear long jeans and long sleeve shirts however much as could be expected when in more unsafe regions.
- Avoid dull shaded garments since it draws in wasps.
- Avoid items with fragrance, for example, aromas, suntan creams, hair items, cleansers, and so forth pick unscented items when outside.
- Some nourishments will draw in wasps and honey bees to your range. In this way, maintain a strategic distance from open refuse territories, keep nourishment secured, don't leave open jars or jugs of lager

or sodas lying around, and check before drinking them.

- Keep quiet when honey bees and wasps draw close. A wasp/honey bee sting will probably happen if the honey bee/wasp is unsettled due to sudden developments or arms attempting to swat at it.
- Avoid ranges where homes are found. Contact an expert to evacuate them, in the event that you don't feel sufficiently equipped to do it without anyone else's help. Shameful expulsion may prompt numerous wasp/honey bee stings.

Wasp and honey bee sting treatment

First aid treatment

- Remove the sting from the site of bite.
- For less severe local reactions, a mild painkiller such as acetaminophen or ibuprofen can be used to make the victim more comfortable
- Topical anesthetic creams will also help relieve the pain
- Anti histamines are also very useful for a wasp sting
- Hydrocortisone creams or calamine lotions can also help reduce swelling and itch
- Cold compresses and ice packs can reduce swelling, ease the pain and slow the spread of the venom
- A paste of baking soda can also be used to relieve some of the wasp sting symptoms
- To prevent infection it is a good idea to wash the affected area with anti bacterial soap and water and treat the area with an antiseptic
- An anti bacterial ointment may also be used
- "As a caution avoid scratching, since this is a major cause for infections [37]."

Antivenom

There is no specific anti venom to counteract wasp and honey bee bites.

Drug treatment

A. Antihistamines- H1 receptors antagonists block the effects of histamines diphen-hydramine and hydroxyzine are two of the most widely used H1 blockers for oral and parenteral use in wasp stings.

- "Diphenhydramine (Benadryl)

For symptomatic relief of symptoms of caused by the release of histamine in allergic reactions [37]."

Dose-25-50 mg

- Hydroxyzine (atarax, vistaril)

Antagonizes H1 receptors in the periphery. May suppress histamine activity in sub cortical region of CNS.

Dose- Atarax- 25 mg

Vistaril-25-100 mg

B. Glucocorticoids- these agents modulate and decrease the inflammatory response to the sting. Early administration continues to stabilize the patient

- Methyl prednisolone(solu-medrol, medrol)

In severe cases of serum sickness, parenteral steroids may be beneficial to reduce inflammatory effects of this immune complex-mediated disease.

Dose-125 mg IV

- Prednisone(sterapred)

May decrease inflammation by reversing increased capillary permeability.

Dose-20-40 mg

C. Sympathomimetics- Epinephrine and the inhaled beta agonist albuterol, reverse the effect of histamine.

- Epinephrine(adrenaline, epipen)

Beta agonist effects of epinephrine include bronchodilation, chronotropic cardiac activity and positive inotropic effects. It can be administered subcutaneously for mild to moderate reactions and intravenously.

Dose- 0.01mg/kg to max dose of .5 mg intramuscularly of 1:1000 solution

- “Albuterol (proventil, ventolin)

Relaxes bronchial smooth muscles by action on beta 2 receptors with little effect on cardiac muscle contractility.

Dose-albuterol sulphate 0.5% inhalation solution: 2.5 mg o.b. albuterol

To administer 2.5 mg of albuterol, dilute .5 ml of the .5% solution with 2.5 ml of sterile normal saline solution ; adjust flow rate of nebulizer to administer solution over 5-15 mins [37].”

D. Glucagon- Pancreatic alpha cells of islets of langerhans produce glucagon, a polypeptide hormone. Glucagon elevates blood glucose levels by inhibiting glycogen synthesis and enhancing the formation of glucose from non carbohydrate sources, such a s protein and fats (gluconeogenesis) increases hydrolysis of glycogen to glucose (glycogenolysis) in liver in addition to accelerating hepatic glycogenolysis and lipolysis in adipose tissue. It also increases force of contraction in the heart and has a relaxant effect on GI tract. That use for anaphylaxis is higher than the usual dose of 1 mg (1 unit) i.v. /i.m. /s.c. used to treat hypoglycemia Dose- 1-5 mg i.v. bolus followed by infusion of 5-15 mcg/min.

E. Antihistamine- H2 blocker-The combination of H1 and H2 antagonists may be useful in chronic idiopathic urticaria not responding to H1 antagonists alone. It may also be useful for itching and flushing in anaphylaxis, pruritis, urticaria and contact dermatitis.

- Famotidine (pepcid)
H2 antagonist that, when combine with an H1 type, may be useful in treating allergic

reactions that do not respond to H1 antagonists alone.

Dose: 20mg i.v.

Homeopathic treatment:

Homeopathic remedies can be useful for relieving the pain and swelling of insect bites and stings.

- **Aconitum napellus:** This remedy can be helpful if a person feels fearful or panicked after being stung. Cutting, stabbing, or burning pain may be felt, along with swelling, tingling, or numbness. Aconitum should be used immediately, while symptoms are intense, and can be followed by another remedy, as indicated.
- **Apis mellifica:** If a bite or bee sting causes puffy, tender swelling that is pink or red and hot to the touch, this remedy may be helpful. The area stings and burns, and cold applications bring relief. (If a person is allergic to insect venom, especially bee-stings, Apis may help to reduce the swelling of the passages, given as first aid while on the way to emergency medical care.) This medicine is used if there is considerable swelling, heat, tension and redness. Any heat makes the pain worse and it will be better for cold applications.
Dosage: Give Apis 30 or 200 every 10-15 minutes until the swelling is reduced, and then 3 times a day until symptoms subside.
- **Cantharis:** This remedy may be indicated if a bite or sting results in intensely burning, scalding pain.
- **Carbolicum acidum:** This remedy is usually indicated in first-aid situations, while medical help is being sought.
- **Hypericum:** This remedy is known for its soothing effect on injuries to nerve-rich body areas.

- **Ledum palustre:** Swelling that extends some distance from the bite, often with a bluish tinge, a feeling of cold and numbness, and aching pain, suggests the use of this remedy. If the swollen part seems cold, but the application of ice or cold water brings relief, Ledum is strongly indicated.

Use Ledum after any insect bite or sting, and it can also be given after an animal bite to help prevent sepsis. The sting is better for cold applications such as a cool compress or cold water, and the wound may feel cold to the touch. The pains may be pricking and stinging and there may be redness and inflammation.

Dosage: Give Ledum 30, three times a day until symptoms subside.

- **Urtica urens:** Reddish blotches that burn and itch intensely (like a nettle sting) after insect bites may be relieved with this remedy. It is also a useful remedy for hives that sting and itch.

Other homeopathic remedies

- Calendula cream, rub small amount of calendula cream into skin several times daily.
- Lavender oil, apply a few drops of lavender oil to skin several times daily or as needed. If necessary, use one or two drops every fifteen minutes.
- Tea tree oil, apply one drop of tea tree oil to skin several times daily. If skin irritation develops, discontinue use of tea tree oil.
- Vitamin C, 1,000 mg thrice daily. If diarrhea develops, reduce the dose.
- Bromelain, 500 mg thrice daily (on an empty stomach).
- Quercetin, 500 mg thrice daily twenty minutes before food. Good idea to combine

with bromelain.

- If it is a wasp sting, bathe the area with diluted vinegar or lemon juice.
- With a bee sting bathe the area in a solution of bicarbonate of soda.

Ayurvedic treatment

- “Immediate relief for a bug or mosquito bite, bee sting or wasp sting can be attained from applying a paste made of meat tenderizer and a little water. Leaving this on for at least a half hour will take away the pain and itch.
- You can also use a slice of raw onion or a slice of raw potato.
- When part of a stinger remains in the skin, you can apply a poultice to safely draw the stinger out. A good poultice is stale bread wetted with milk, and it may be necessary to repeat this, adding a new one after the last one dries.
- Wasp venom is on the alkaline side. To counteract the venom rub some onion juice or natural apple cider vinegar on the bite. Split the leaf of a leek and apply the inside surface to your skin.
- Ant bites and bee stings are more acidic in nature. For these you want to neutralize the effect of the venom with a paste of baking soda and very cold water.
- Apply straight lemon juice.
- A clay or mud paste can also be used to draw out the venom.
- Use a wet tea bag as a poultice: the tannic acid in tea helps with swelling. Black tea is the most effective.
- Put a slice of cucumber over the area, this is especially effective for ant bites!
- To reduce swelling, put on a drop of Lavender Essential Oil or Eucalyptus Essential Oil [37].”

Traditional treatment

Many traditional remedies have been suggested for wasp/bee stings such as:

- a) Damp pastes of-
 - Tobacco • Salt • Baking soda
 - Meat tenderizer • Toothpaste • Clay
 - Garlic • Urine • Onions • Aspirin
- b) Even application of iron/copper coins.

D. Lonomia (Caterpillar)

Genus – Lonomia

Species –

- frankae
- obliqua
- rufescens

Common Indian name - jheenga, keeda (Figure 5).

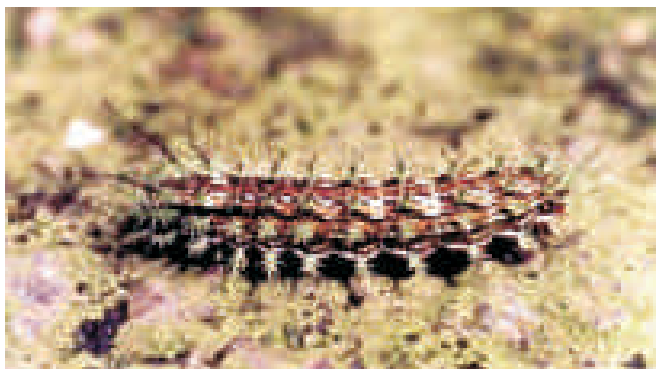


Figure 5 : Lonomia moth

Description

“The caterpillars are themselves extremely cryptic, blending in against the bark and leaves of trees, where the larvae commonly aggregate. The larvae like most hemileucines are covered with urticating hairs, but these caterpillars possess uniquely potent anticoagulant venom [38].”

Lonomia venom

The contents of Lonomia venom are as follows:-

- Fibrinolytic enzymes – which degrade fibrinogen.

- Prothrombin activators – “one direct and one factor X a-like; a thermostable factor V activator; a thermolabile factor V inhibitor; a factor XIII proteolytic/urokinase-like activity; and a kallikrein-like activity [38, 39].”

In *Lonomia obliqua*, three activities have been described:

- A prothrombin activator called ‘Lonomia oblique prothrombin activator protease’ (LOPAP)
- A factor V activator
- A phospholipase A2-like activity called Lonomiatoxin.

Other toxins present are –

- Fibrinogenase
- Hemolytic factors
- Hyaluronidases
- *L. obliqua* stuart factor activator (losac)
- *L. obliqua* toxins active in endothelial cell cultures [39].

Toxicity and signs & symptoms of Lonomia venom

“An average envenomation episode includes a man unwittingly inclining toward, putting their hand or rubbing their arm against a gathering of these caterpillars that are assembled on the storage compartment of a tree. The impacts of a dosage from numerous caterpillars can be sensational and serious, including monstrous inward draining, renal disappointment and hemolysis. The subsequent therapeutic disorder is called Lonomiasis. Lonomia venom will be among the most reduced for any common poison known. All patients exhibit torment and a consuming sensation at the site of contact [40].”

Human infection from caterpillars or moths generally emerges from coordinate contact, presentation to substances or creatures that have been plagued with caterpillars or their networks, or contact with airborne caterpillar flotsam and jetsam.

Lepidopterism is a fundamental disease that happens following such contact, and it is exemplified by diffuse urticaria, upper aviation route aggravation, queasiness, heaving, cerebral pain, and bronchospasm.

Dendrolimiasis is a more endless ailment that takes after contact with the Asian Dendrolimus pini caterpillar. Patients with this issue show a pruritic maculopapular rash and transitory polyarthritis/polychondritis, which can advance to constant osteoarthritis. Incidentally, intense scleritis happens also.

Ophthalmia nodosa presents with intense conjunctivitis, advancing to panophthalmitis, following entrance of the cornea by urticating hairs. Immoderate coagulopathy with auxiliary fibrinolysis happens most normally following stings by the South American Lonomia caterpillar whose venom actuates factor X and prothrombin. Patients can show seeping from any anatomic site and may create intense renal disappointment.

Caterpillar venoms are created by glandular cells in the epithelium and are put away in and infused by urticating hairs and spines (setae). A few animal types create lethal hemolymph, which can cause human illness.

In a few patients, immunoglobulin E (IgE) antibodies are delivered following contact, bringing about an extremely touchy state and the generation of summed up urticaria on resulting re-contact. A couple of caterpillars lacking urticating hairs are fit for initiating a contact dermatitis (sort IV touchiness).

In the skin, diffuse vascular dilatation happens, with consequent edema arrangement in the shallow dermis and swelling of keratinocytes inside the epidermis that can prompt vesiculation. In the eye, hairs have a surprising infiltrating limit and may work their way into the cornea, foremost chamber, or focal point, where an extreme incendiary reaction happens optional to the idea of the remote material and direct poisonous impacts.

Caterpillar venom-filled spines, discovered just in the larval structures (grown-up moths and butterflies don't sting), are empty structures with a solitary basal toxic substance cell that produces poison. At the point when squeezed into the skin, the tip of the spine cracks and the venom is infused under weight. Poisonous quality decreases fundamentally after the animal's demise, yet aggravation or harmful hairs may hold the capacity to cause dermatitis for quite a long time. In like manner, the harmful hemolymph of a few caterpillars holds its strength for delayed periods after the creature's passing.

Caterpillar venoms are ineffectively considered however may contain peptides, hyaluronidase, phospholipase An, and biogenic amines, for example, histamine or histamine-discharging substances. A few, for example, the South American Lonomia species, contain fibrinolytic proteases and coagulation activators that can animate an immoderate coagulopathy and renal disappointment in casualties.

The regularly observed impacts are as per the following-

1. Reaction to the bothering impact or sting ranges from gentle, with neighborhood blushing, swelling and tingling, to rather serious contingent upon the defenselessness of the individual, the delicacy of the skin and place of contact.
2. Hypersensitive people may encounter side effects or potentially hypersensitive responses, illustration extreme swelling, sickness, trouble in breathing and summed up fundamental response.
3. People that interact with stinging caterpillars for the most part create wheals and boundless rashes which can be joined by a consuming sensation.
4. Other indications incorporate dermatitis, papules, torment, tingling, intestinal

unsettling influences, sores as well as swelling of the contaminated region.

5. Detached hairs can likewise be breathed in and the upper respiratory tract can be influenced delivering dyspnoea or worked relaxing.
6. "Injuries to the eye have been recorded, bringing about conditions, for example, nodular conjunctivitis and less generally, lasting harm to the cornea [41]."

Treatment of *Ionomia venom*

First aid treatment

- Clean the wound with soap and water, which may help remove some of the irritating venom.
- Adhesive tape or transparent tape may be used to pull out some of the broken spines in the sting area.
- Stings and abrasions caused by *L. obliqua* should be treated with anti-fibrinolytics.
- Ice packs may be applied to reduce pain.

Anti-venom

- Soro antilonomico (inj.)

Drug treatment

- Anti-histamines (H1 or H2 blockers) are the first drug of choice.
 - Diphenhydramine
 - Cimetidine
- Topical steroids may be employed. Systemic steroids may be necessary in patients with severe or persistent cutaneous symptoms.
- Application of anti-pruritic products containing menthol may be soothing.
- Prostaglandin-synthetase inhibitors such as aspirin or indomethacin have been reported to reduce associated discomfort, but should

be avoided if any evidence of coagulopathy is present.

- Adrenergic agonists such as epinephrine are also recommended.
- Analgesics may be required for stings.

Mild cases may be treated adequately with oral opiates like hydrocodone or oxycodone, while more severe pain requires parenteral agents such as morphine sulfate.

Homeopathic treatment

The hair of caterpillars causes violent inflammation. Do not rub, for it will only make it worse, but apply handkerchiefs which have been moistened with spirits of camphor.

E. Jelly Fish

Genus – *Chrysaora*

Species – *quinquecirrha* (Figure 6)



Figure 6 : Jelly fish

Jelly fish stings

"Jellyfish are free-swimming, non-aggressive, gelatinous marine animals surrounded by tentacles. These tentacles are covered with sacs (nematocysts) that are filled with poison (venom) that can cause a painful to sometimes life-threatening sting. The marine animals included in the "family" are jellyfish, box jellyfish (sea wasps), Portuguese man-of-war, hydroids, anemones, and fire coral. Jellyfish are found throughout the world. But, the most deadly are found in the Indo-Pacific and Australian waters. Jellyfish are

usually found near the surface of the water during times of diminished light, floating in the water column, or after washing up on the beach. Jellyfish stings are generally accidental - from swimming or wading into a jellyfish or carelessly handling them [42]."

Some types of jellyfish have reproductive jelly gatherings 8 to 10 days after a full moon, thus there is an increase in the number of jellyfish found at that time.

Chemistry of jelly fish sting

"The toxin of Cnidaria is located in cnidocytes, which are stinging cells composed of organelles called nematocysts. Nematocysts are present on the outer surfaces of tentacles or near the mouth. Nematocysts are contained within the cnidoblast or the outer capsule. On the external surface of the cnidoblast is the cnidocil (trigger point), which can be triggered by mechanical or chemical stimuli or may have remote and local control. At the base of the cnidocil is a hollow, coiled, sharp, threaded tube containing venom. The threaded tubes have denticles, which give the uncoiling thread cutting power like a drill. Extruded threads may reach up to 1 mm in length, a distance that is sufficient to penetrate the dermis of human skin. It is currently believed that the explosive release of the thread is caused by a sudden release of spring like tensions stored in the collagenous structural compartment. This is likely due to the sudden removal of bound calcium ions, resulting in a sudden increase in osmotic pressure in the capsular fluid [43]."

Nematocysts contain a liquid mixture made up, mainly, of peptides and lipophilic enzymes like hypnotoxine and rhizolysine, which are poisons and others like thalaxine and congestine, which act as allergens.

The venom of many species is complex and largely unknown. The majority of toxins contain a complex mixture of polypeptides and proteins including:

- (1) catecholamines,
- (2) histamine,

- (3) hyaluronidase,
- (4) fibrinolysins,
- (5) kinins,
- (6) phospholipase, and
- (7) various hemolytic, cardio toxic and dermatonecrotic toxins.

Jelly fish sting symptoms

"Symptoms include an intense, stinging pain, itching, rash, and raised welts. The progressive effects of a jellyfish sting may include nausea, vomiting, diarrhea, lymph node swelling, abdominal pain, numbness/tingling, and muscle spasms. Severe reactions can cause difficulty breathing, coma, and death. A sting from a box jellyfish or other venomous types of jellyfish can cause death in minutes [44, 45]."

Prevention of jelly fish sting

- Wear defensive dress (gloves, wet suits, jump skins) when swimming in jellyfish-swarmed ranges. Abstain from grabbing dead jellyfish. Dead jellyfish may at present have live nematocysts that can in any case discharge poisons (even after they have become scarce).
- Avoid going into known jellyfish-pervaded ranges. In the event that you do, recognize what kind of jellyfish are normal to the zone.
- Be arranged to treat a jellyfish sting. Have a fundamental emergency treatment pack (ensure it has an oral antihistamine in the unit) arranged and carry it with you.
- Take a course in fundamental emergency treatment before going to the shoreline, snorkeling, swimming, or scuba plunging.
- In the night or around evening time when swimming, snorkeling, or scuba jumping, take watch over jellyfish on the surface of the water.
- Expel air from the other air source while rising amid scuba jumping to scatter any jellyfish straightforwardly above you.

- Educate yourself with regards to the kind of jellyfish that might be in the waters in which you are swimming, snorkeling, or scuba plunging.
- Bring Safe Sea Jellyfish After Sting® torment help gel on the off chance that you do get stung.
- Do not swim in waters where substantial quantities of jellyfish have been accounted for. Wearing a wet suit or Lycra jump skin can forestall stings.
- If you have a known creepy crawly sting hypersensitivity convey a sensitivity pack, which contains injectable epi-pens (epinephrine, adrenaline). Ensure those with you know how to control the epi-pen in the event that you can't do as such.
- “Do not touch any marine life while swimming, snorkeling, or scuba jumping. Most marine creatures have a defensive covering that when touched, is rubbed off when and opens the creature to microbes and parasites; besides, touching, "playing," or moving marine creatures is distressing for them. Corals are effectively harmed when touched and the range if the coral touched by hands, blades, or the body will bite the dust. To secure the sea condition, when swimming, snorkeling, or scuba plunging look, don't touch, and leave just air pockets [46].”

Jelly fish sting treatment

First aid treatment

- If you are not near therapeutic care, splash the range and limbs for 10 minutes or more, before endeavoring to evacuate them.
- If the sting is on the arms or legs, you can put a weight dressing (like an ACE wrap utilized for a sprained lower leg) around the sting. Be watchful that you don't stop blood stream - the fingers and toes ought to dependably

remain pink. This will back off the spread of the poison.

- For other jellyfish stings, douse or wash the zone in vinegar (acidic corrosive) for 15-30 minutes to prevent the nematocysts from discharging their poisons. In the event that you don't have vinegar accessible, flush in ocean water, 70% isopropyl liquor, or Safe Sea Jellyfish After Sting® torment help gel.
- Do not utilize new water. New water will cause the nematocysts to keep on releasing their poison. For a similar reason, don't rub the territory, apply ice or heated water.
- Remove appendages with a stick or a couple of tweezers. Wear gloves in the event that you have them accessible.
- Apply shaving cream or a glue of preparing pop to the region. Shave the region with a razor or charge card to evacuate any follower nematocysts. At that point reapply vinegar or liquor. The shaving cream or glue averts nematocysts that have not been actuated from discharging their poison amid evacuation with the razor.
- Eye stings ought to be flushed with a business saline arrangement like Artificial Tears; touch the skin around the eyes with a towel that has been absorbed vinegar. Try not to put vinegar specifically in the eyes.
- “Mouth stings ought to be treated with 1/4 quality vinegar. Blend some vinegar with some water. Swish and release the arrangement. Try not to drink or swallow the arrangement [47].”

Drug treatment

1. Anti-histamines –

Antihistamines such as diphenhydramine (Benadryl) can control skin pruritis.

2. NSAIDS –

For pain, take acetaminophen (Tylenol) 325 mg 1-2 tablets every 4-6 hours or ibuprofen (motrin) every 8 hours for pain.

3. Steroids –

Topical steroids or steroids by mouth may be administered to help with the swelling and itching.

4. **Antibiotics** can also be given in some cases [48].

Anti-venom

- CSL box jelly fish anti-venom (inj.)

Ayurvedic treatment

1. **Sarsaparilla** is a very good herbal treatment for jelly fish stings. Sarsaparilla is also known as root beer, however, a powder needs to be made by drying this root beer and then boiled in water. 1 tablespoon should be boiled in water and cooled. This should be strained and imbibed thrice daily for three days.

2. The boiled water of the powder of the leaves of *Casearia sylvestris* is also a very potent herbal treatment for jelly fish stings. Drink the filtered water of this powder for 3 days and apply it to the stings if required and the situation is improved in 2 days.

Homeopathic treatment

- Vinegar

The acetic acid in vinegar stops nematocysts from discharging jellyfish venom; it is the remedy most often used by beach lifeguards. Flood the area or soak it with a vinegar compress for 15 minutes, then use gloves, tweezers or a stick to remove tentacles. Soak the area in vinegar again, or as a follow-up to other treatments. Vinegar can be dabbed on the face, but eyes should only be rinsed with a saline solution. Stings in the mouth can be rinsed with a one-quarter strength solution of vinegar and water. Swish and spit but don't swallow.

- **Baking Soda**

Apply a paste of baking soda; it will prevent

nematocysts which have not been activated from discharging their venom. Leave the paste in place for half an hour, or until pain subsides. Scrape the wet paste off with the edge of a credit card. Rinse with saltwater or vinegar and reapply as needed.

- **Fruit**

A paste made from papaya fruit contains enzymes that can be helpful if left in place for 30 minutes. Fresh citrus juice squeezed from lemons or limes contains acetic acid and will have actions similar to vinegar.

Other homeopathic remedies include:-

- If there is an inclination to vomit, encourage it, give charcoal with sugar and water, or in molasses.
- Let the patient smell camphor and afterwards drink coffee without milk.
- “For eruption and swelling of face, give belladonna [49].”

F. Indian Monitor Lizard

Genus – Varanus

Species –

- acanthurus
- bengalensis
- goldi
- griseus
- indicus

Common Indian name - guhera, goyra, chhipkali (Figure 7).

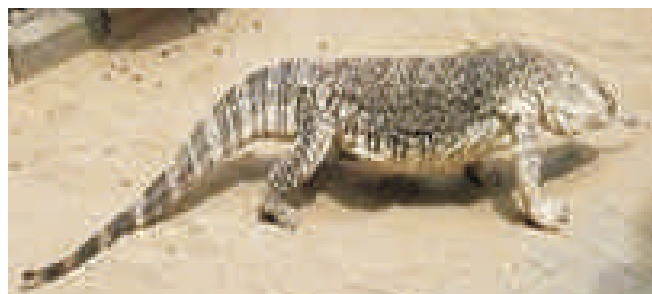


Figure 7 : Indian monitor lizard

Description

"Gila monster, Mexican beaded lizard and monitor lizards are few of the venomous lizards on this earth. They feed on bird and reptile eggs and occasionally upon small birds, mammals, frogs, lizards, insects and carrion. Envenomation of lizards is very uncommon but venomous lizards cause life threatening symptoms. They tend to hold on with their jaws while biting and the longer the jaws remain attached to the skin, the more severe the poisoning may be [50]."

Lizard venom and its contents

"The venom apparatus is much less sophisticated than that of most venomous snakes. A pair of multilobed labial venom glands (modified submandibular glands) lies in the anterior portion of the lower jaw. The teeth (approximately 20 per jaw) are grooved and loosely attached to the jaws. Venom is conducted via capillary action along these grooves into the victim's tissues as the lizard bites and chews. The more irritated the lizard is when it bites, the more it salivates and the greater the venom yield. Effective envenomation in humans probably occurs in less than 70% of bites. Venom is produced in modified salivary glands in the lower jaw, whose venom is produced in the upper jaw. The venom is neurotoxic [51, 52]."

More than a dozen peptides and proteins have been isolated from the lizard's venom including-

- hyaluronidase
- L-amino oxidase
- serotonin
- phospholipase A2
- several kallikrein like glycoproteins, which are responsible for the pain and oedema caused by a bite.

Four potentially lethal toxins have been isolated from the gila monster's and monitor lizard's venom, including horridum venom, which causes haemorrhage in internal organs and exophthalmos (bulging of eyes), and helothermine, which causes lethargy, partial paralysis of the limbs and

hypothermia.

However the constituents most focussed on are the bioactive peptides, including-

- helodermin
- helospectin
- exendin-3
- exendin-4

Most are similar in form to vasoactive intestinal peptide (VIP), which relaxes smooth muscle and electrolyte secretion between the small and large intestines. These bioactive peptides are able to bind to VIP receptors in many different human tissues.

Helodermin has been shown to inhibit the growth of lung cancer.

Effects of lizard poisoning

The list of signs and symptoms of lizard poisoning is as follows:-

- pain at the site of bite
- swelling at the site bite
- spread of swelling
- slightly reduced blood pressure
- puncture wounds on skin
- increased heart rate
- breathing problems
- enlarged lymph node
- dizziness
- numbness
- chills
- nausea and vomiting
- sweating
- faintness [52].

Treatment of lizard poisoning

First aid treatment

- Remain calm and try to rest quietly.
- Remove any jewellery. The limbs might swell;

making it more difficult to remove the jewellery after the swelling begins.

- Use direct pressure to stop any bleeding. But do not suck the bitten area.
- Look at the wound to make sure a lizard tooth is not in the wound. If you can see a tooth, remove it with tweezers.
- Clean the bite as soon as possible to reduce the chance of infection. Wash the wound for 5 minutes with large amounts of warm water and soap.
- Apply a clean bandage when it gets wet or soiled. If available use a non-stick dressing.
- “An ice or cold pack may help reducing swelling and bruising [53].”

Drug treatment

- Analgesics & antipyretics: Acetaminophen such as Tylenol or Panadol.
- Antibiotics: Use of an antibiotic ointment such as Polymixin B Sulphate and Bacitracin may be done.
- Sometimes a tetanus shot may also be administered.
- “Anti-venom to counteract the effects of the poison can save limb or your life [53, 54].”

Homeopathic treatment

- When the poison or urine of lizard has got into the eye, washing the eye with warm milk and water has been recommended.
- Aconite – It is used externally in the form of liniment as an analgesic, anti-inflammatory and cardiac depressant.
- A tablespoonful of finely powdered charcoal with milk or sweet oil may help.
- “If sudden and dangerous symptoms appear, let the patient smell sweet spirits of nitre. Sometimes after give Arsenicum [54].”

Ayurvedic treatment

- “If you're fresh out of lizard bite, make a poultice from two crushed onions mixed with a few drops of kerosene, and apply it to the bite. After a short time, it should draw out the poison, turning the poultice green [55].”
- Mix a wad of tobacco with saliva or water. Apply this paste directly on the bite.
- “Macerate about 1 oz. fresh lavender flowers in about 2 ½ cups of olive oil in sunlight for about 3 days. Stain the content either through muslin or sieve and repeat it for three days. Store it in a dark glass bottle kept in a cool place and have it in small quantities [56].”

Conclusion

The literature survey from Chemical Abstract, Biological Abstract, Indian Journal of Pharmaceutical Research, Pharma Times, Remington's Pharmaceutical Sciences, Essentials of Medical Pharmacology, Clinical Pharmacology, Indian Journal of Experimental Biology, Current R&D Highlights and Net services gave us a lot of information about Health Management of People Affected by Some Poisonous Animals i.e. introduction, poisonous animals (including snake, scorpion, wasp, bee, jellyfish, Isonomia and Indian monitor lizard, their venoms & effect on human body and treatment procedures), epidemiology, WHO guidelines and manufacturers & exporters of animal bite treatment products.

Deadliest animals possess venom/toxins in their body which is present in their saliva, teeth, stings, hairs, etc. They use this venom as a defense mechanism for their protection and thereby cause serious envenomation in human beings. It may lead to death in certain cases, so the situation needs to be treated. Various allopathic, ayurvedic, homeopathic and traditional remedies are employed for the management of health of the poison affected people. In the mean time, patients should be referred promptly to a hospital/specialist center where the appropriate treatment can be started without any further delay, based on a careful evaluation of patient's condition.

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Management Table Modelling for Flexible Database Design of Finance Application Module of Hei Erp

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Abstract

The functional and operational integration offered by ERP package presents a consistent effective solution over the complex operations of organizational activities by streamlining the operations which lessen the complexities and the underlying processes in its various departments by integrating all the departments and functions for maximum utilization of available resources. There are some potential obstacles to any ERP implementation which are associated with the database management which can be managed and resolved through flexible database design. Database flexibility can operationally affect the efficiency of the enterprise system and in long term it overall affects the effectiveness of the systems implemented in the institutions, so the particular concept of the database flexibility must be consider as very crucial or key success factor throughout the design phase as well as in implementation phase as well. This paper will present the management table modelling of finance application module of the higher educational ERP system to express it as the implementation problems solution in different scopes (School and Higher Educational Institutions) of the education industry.

Keywords: ERP, Database, Application, Module, Flexible Database Design, Implementation Phase, Design Phase

Introduction

The scale of the university and the departments, facilities offered varies accordingly just like operational and functional difference of the organization, in a common phrase institutional goals, expectations, mission, values and opportunities frequently varies from institution to institution or university to university; though, each of the goals, expectations, mission, values and

opportunities are near about related functionally and operationally to the way each institution or university of higher education conducts its activities[6]. There are some potential obstacles to any ERP implementation which are associated with the database management which can be managed and resolved through flexible database design. Database flexibility can operationally affect the efficiency of the enterprise system and in long term it overall affects the effectiveness of the systems implemented in the organizations or institutions, so the particular concept of the database flexibility must be consider as very crucial or key success factor throughout the design phase as well as in implementation phase as well[1].

ERP flexible database design development phase is something like developing the database system according to the customized need or standard need of the industry for which ERP is to be developed, but in the implementation phase of ERP a well-defined database design framework is required to be executed, which must be already approved for the successful implementation by any other institution for the same institutional domain or a standard implementation framework can also be followed for the implementation[2].

Study over the finance application domain is presented in this research paper has been chosen as the full functional application domain of the higher educational ERP system to express the implementation problems in different scopes (School and Higher Educational Institutions) of the education industry. Finance module of the ERP application is an effective Finance management solution manages budget and meet institutional reporting requirements. This is a suite consisting of integrated modules that gives executive functions to the departments like Accounting, Payment operations, Transaction, Budget plan, Scholarship / Grants management, Stock Management, Book keeping and Report generation. Finance application module is an authoritative management and planning tool to

express what the institution will perform financially in the particular period.

Finance application module found quite useful because it emphasizes on detailed resource allocation according to the institutional plan constructed in the particular financial period. Appropriate financial planning leads to better management principals, which ultimately leads to good institutional financial performance. Financial application module majorly presents all those set of information which is prepared directly by top management but whole institution would have contributions to it. Financial application management and all the allied financial processes may have some differences according to country, industry and other legal standards.

Finance Application Database Design of Higher Education Institution Erp by Management Tables

CBSE Schools of Udaipur district of Rajasthan have been chosen as the sample institution to know about the dataset prerequisite set of finance applications in school industry. In the first step of the data set requisition and analysis interviewing the finance specialist and the finance administrator including with the other personnel of the department was initiated. From the figures collected through the requisition step of the database design process is conceptual design was structured.

Table 1: Conceptual Design Entity and Attribute list

Entity Name	Attribute List
Financial Plan Name (FP)	Name, Code, Start Date, End Date, Tenure, Description, Amount, Project Association
Accounts Branch Centre (ABC)	Name, Code, FP module fill, Description
Expense Orders (EO)	Date, Amount, Order Number, Description, FP Code, Reason, Quantity, Amount, Currency

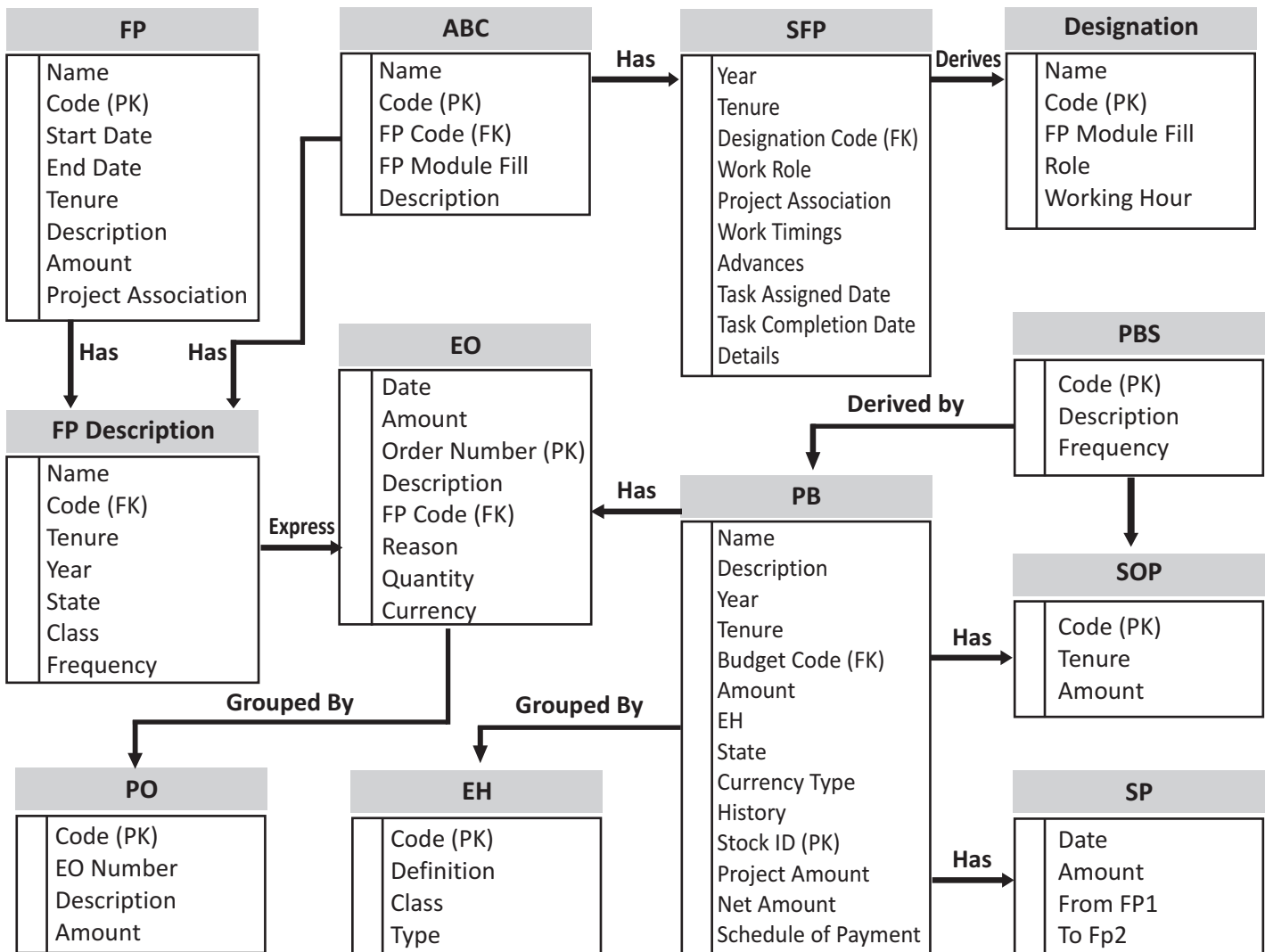
Project Budget (PB)	Name, Description, Year, Tenure, Budget Code, Amount, Expense Heads (Code, Definition, Class, Type), State, Currency Type, History, Stock ID, Project Amount, Net Amount, Schedule of Payment (Date, Amount, From FP1, To FP2)
Staff Financial Plan (SFP)	Year, Tenure, Designation (Code, Name, FP Module Fill, Role, Working Hour), Work Role, Project Association, Work Timings, Advances, Task Assigned Date, Task Completion Date, Details

Source: Author' compilation from requisition step

Comparative Study

Top-Down strategy is used for the schema design. Top-down database design strategy is quite primitive design approach in which big entity sets are decomposed into smaller entity type into several entity types[3]. Entity Relationship diagram of the finance application module of school based ERP is presented below in Figure 1. The ERD is designed on the basis of the entity set defined, attributes identified, relationships studied through the interview sessions of finance officers and administrators during the requisition step of the database design step. The ER diagram is drafted according to the entity sets, attributes and relationships acknowledged throughout the

Figure 1: Conceptual Design of Finance Application Module of School ERP

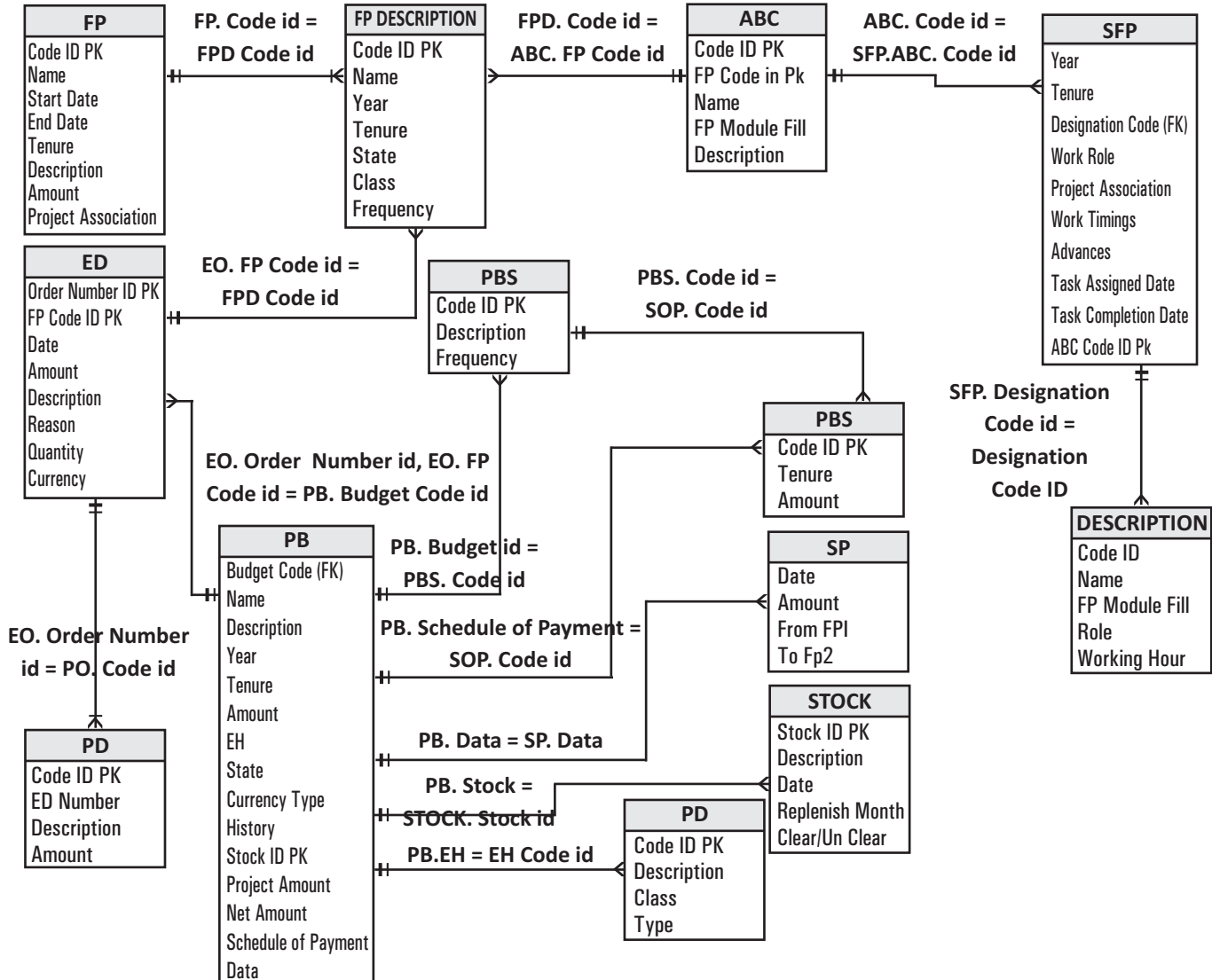


requisition compilation stage, database design schema.

The logical design is the abstract design model which

represents the arrangement of data into a series of logical associations of the database before realizing the datasets and entities into the physical design.

Figure 2: Logical Design of Finance Application Module of School ERP



And finally in the physical design the expected schema of the database as presented in the logical design is translated into actual database structures. In the physical designing mapping of entities into tables, association establishment in between tables through foreign and primary key, defining the attributes to columns, primary key building, and unique key building is performed.

To identify the scope of flexibility over the existing database design of the finance application module while implementation of the finance application

module of school over the higher education institution no changes was performed in the design and structure of the design. Interview sessions were conducted for studying and analysing the finance application system of the study areas' colleges and universities which helped to understand the functions and complexities associated with the finance system. Issues identified in the form of extra data item declaration, extra entity set declaration, alternation of exiting data set during the implementation of Financial Application Module of School in Higher Education Institution are presented in Table 2.

Table 2: Issues in implementation of Financial Application Module of School in Higher Education Institution

Name of Entity	School	HEI	Implementation Issue
Financial Plan Name (FP)	Adequate	It is required to identify the faculty id and coordinator id	Extra data fields required in other entity or as attributes of existing table
FP Description	Adequate	FP Coordinator Id is required	Extra Data field to maintain coordinator id is required
Faculty Description (FD)	-	Faculty Id, Name, Coordinator Id, Type	New entity is required with described set of fields
FP Coordinator (FPC)	-	FP Coordinator Id, Name, Detail, Month	New entity is required with described set of fields
Accounts Branch Centre (ABC)	Adequate	Faculty Id and FP Coordinator Id is missing	Extra fields required and for listed fields separate entities are required
Admin Budget Plan (ABP)	-	Attributes to be added faculty id, activity, Budget allocated, Expense order No, FP Module fill, Admin Id	New entity is to be create with described set of fields
Admin Details (AD)	-	New fields – Admin Id, Name, Detail, Designation, From, To	New entity is required to be create with described set of fields
Expense Orders (EO)	Adequate	Fields - Faculty Id, Year to be added and date is to replaced by month	Extra fields required and replacing of one field require different data type
Purchase Order (PO)	Adequate	Fields - Faculty Id, Status, Frequency	Extra Fields to be declared
Project Budget (PB)	Adequate	New Fields - Faculty Id, Admin Id	Extra Fields to be declared
Expense Heads (EH)	Adequate	No Change Required	-
PBS	Adequate	No Change Required	-
SOP	Adequate	Tenure to replace with Month, New Field - Frequency	Extra data entrance and new field declaration
SP	Adequate	No Change Required	-
Stock	Adequate	New fields – Faculty & Admin Id, Stock In & Out Date, Status. Remove Fields – Date, Replenish Month, Clear / Unclear	For the specific stock detail new data fields are required and some was removed as per requirement
Staff Financial Plan (SFP)	Adequate	New fields – Faculty & Admin Id	Extra Fields to be declared
Designation	Adequate	New fields – Faculty & Admin Id, Details	Extra Fields to be declared

Source: Comparative assessment, Author's Compilation

After identifying the implementation problems that arise from inflexible database design of the finance application module, a completely fit finance application domain is to develop to handle all the above stated implementation issues and challenges. Under the aegis and scope of the commercial Relational Database Management system or application all the issues of the database management such as table configuration, creating user roles and definitions, securities and authorization etc can be handled through the schema of RDBMS[4].

To organize and control the declaration of extra attributes or the data items, all the declared extra attributes or the data items should be addressed to an empty column. The descriptive characters such as name, type and size of all the declared data items requirement should be confirmed and then must be recorded per data item wise. The data entered in the declared empty column may be the values or set of values which were already determined during the implementation and these values may be dynamic by nature throughout the life-cycle of the ERP. To organize and control the declared extra tables and data items or attributes of the financial application module a new schema FIN_APP_MR (Financial Application Manager) with four different tables was created. The definitions of tables created under the new schema FIN_APP_MR are as follows:

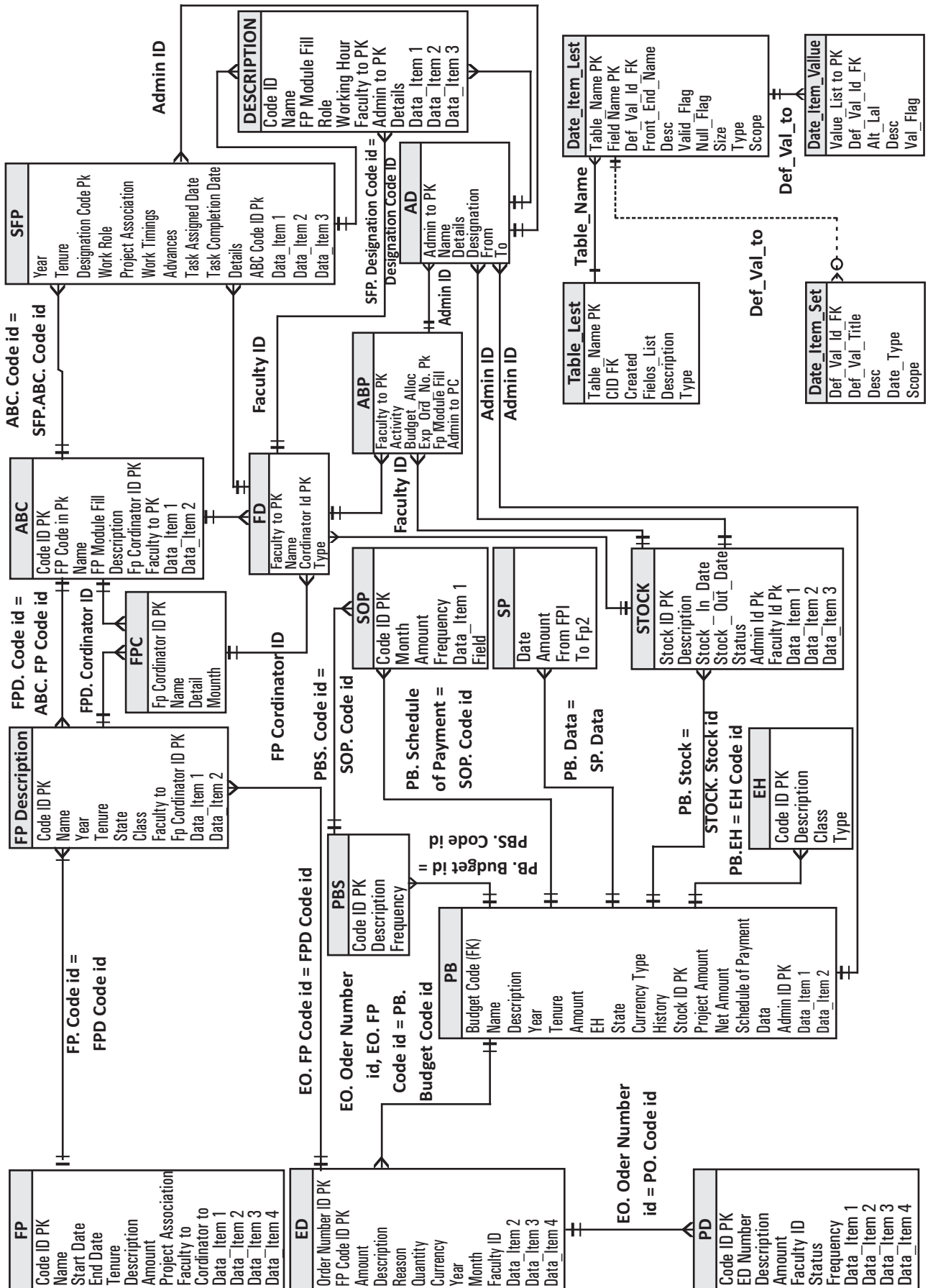
1. FIN_APP_MR.TABLE_LIST
2. FIN_APP_MR.DATA_ITEM_LIST
3. FIN_APP_MR.DATA_LIST_SET
4. FIN_APP_MR.DATA_LIST_VALUES

Table 1: Stakeholders of Cloud Computing System in Educational System

TABLE_LIST	
PK	Table_Name
FK	Cid
	Created
	Fields_List
	Description
	Type
DATA_ITEM_LIST	
PK	Table_Name
PK	Field_Name
FK	Def_Val_Id
	Front_End_Name
	Desc
	Valid_Flag
	Null_Flag
	Size
	Type
	Scope
DATA_LIST_SET	
PK	Def_Val_Id
	Def_Val_Title
	Desc
	Data_Type
	Scope
DATA_LIST_VALUE	
PK	Value_List_Id
FK	Def_Val_Id
	Alt_Val
	Desc
	Val_Flag

All the declared tables and columns under the FIN_APP_MR schema confirms the requirement of flexible database schema for the finance module of the ERP. TABLE_LIST entity records information about the table or entity set declared which were identified during the implementation. DATA_ITEM_LIST maintains the information about attributes or data items identify during the implementation are

Figure 3: Database Schema with FIN_APP_MR Schema – Implementation Issues Resolved – Design I



recorded in this table. As empty data items or attributes may be meaningful according to implementation requirements that are why value list to the declared data items or attributes should be assigned. DATA_LIST_SET table maintains the details of the assigned data value to the attributes of the tables which were identified because of new data requirements during implementation. DATA_LIST_VALUE table maintains the extra data fields' records which are allocated to a value set.

After the integration of the FIN_APP_MR schema to manage implementation issues of extra entity set and data items with the finance application module which was developed for the schools, the flexible database design with management tables as an alternative for flexible finance application module schema is presented below in the figure 3 [5]. The schema presented in the figure 3 confirmed that some extra entity sets and the fields were integrated to improve the flexibility of the database structure.

From the design alternative presented in the Figure 3 as a solution of the implementation issues identified while implementing the finance application module of school ERP in the college or higher educational institutions discloses that the declared extra data item can be used as and when the requirements of extra attributes is identified by the user or the developer of the system. Extra data item declared in the above figure is three or four it never confirms that the actual requirement would be the same for every platform of implementation.

Conclusions and Findings

Since the conceptual design of a system is the state of an information system where early implementation decisions are made, it is important to meet the requirements of a flexible implementation in that stage. Within this context, the database design which the ERP package is built on, should consider the employment of the package modules (application domains) considering requirements of different implementation domains. As there is a need for

building a flexible ERP application, thus flexible database design, it is clear that, new ideas for constructing database design in a flexible manner.

Conceptual Design of Finance Application Module for School ERP presents relationships among the twelve different entity sets. ERD showed normalized form of entity relationship, which later transformed into logical design. The development of logical design incorporated the arrangement of data into a series of logical associations. Management application tables declaration as flexible design alternative extra and empty data items were declared to handle the future requirements of data items. For this new tables were created with the prescribed set of attributes and additional data entries. The descriptive characters such as name, type and size of all the declared data items requirement was confirmed and controlled & managed through a new schema FIN_APP_MR (Financial Application Manager) with four different table structures such as Table_List (To identify the extra tables created and what were the names of the tables), Data_Item_List (To manage details of all data items declared under the particular table as extra data items), Data_List_Set (To manage details of extra data item and its properties declared under the particular table), and Data_List_Value (To manage the values declared for the extra data item as new data item of the existing entity set to avoid the null constraint as well).

This design alternative confirms that declared extra data item can be used as and when the requirements of extra attributes is identified by the user or the developer of the system.

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Study of Antifungal Properties of Cow Urine Extracts of Selected Microalgae

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Abstract

The work is emphasised on the study of the antifungal efficacy of Cow Urine Extracts of *Kappaphycus alvarezii* with *Sargassum* species against fungi, *Saccharomyces cerevisiae*, *Aspergillus candidus*, *Aspergillus niger* and *Pencillium* Species which were obtained from Microbial Type Culture collection, Indian Institute Of Microbial Technology Chandigarh, India .

Result The antimicrobial analysis of the cow urine extracts revealed that *Kappaphycus alvarezii* showed zone of inhibition 10mm against *Aspergillus niger* and 9mm against *Sargassum* species The least inhibited isolate was by *Sacchromyces cervesaie* in both the micro algae species with (6.5 mm) as zone of inhibition *Aspergillus candidus* was inhibited more in *Kappaphycus alvarezii* (10mm) as compared to 6 mm in case of *Sargassum* species The *Pencillium* species showed remarkable inhibition in *Kappaphycus alvarezii* cow urine extracts (9.5 mm)and *Sargassum* species to be 10 mm respectively.

In the present study antifungal activity of cow urine extract of *Kappaphycus alvarezii* and *Sargassum* species against fungi was studied and this inhibitory activity can be used in the control of microbes of various origins .The *Kappaphycus alvarezii* and *Sargassum* species revealed significant antifungal activity against all pathogens. The compilation indicates that cow urine extracts of *Sargassum* species and *Kappaphycus alvarezii* exhibit better antifungal action against different clinical fungal strain. The algae cow urine extracts are sources for development of new novel pharmaceutical agents. The future research lies in utilisation of these extracts to develop algae and plant extracts by making proper formulations of cow urine extracts and to counter various infections caused by microbes, thus boosting the human immune system and development of novel drugs.

Keywords: Antimicrobial Efficacy, Cow Urine Extracts, Sargassum Species, Kappaphycus Alvarezii

Introduction

Marine algae are among the major source of various compounds which may be useful for humans. Commercially available varieties of marine macro algae are commonly referred to as seaweeds. Screening of seaweeds for antimicrobial activity and bioactive constituents is quite imperative. Seaweeds are potential renewable resources in marine environment. Marine algae contain more than 60 trace elements in a concentration much higher than in terrestrial plants. They also contain protein, iodine, bromine, vitamins and substances of stimulatory and antibiotic nature. Seaweeds are considered as best source of bioactive compounds with cystostatic, antiviral, antihelminthic, antifungal and antibacterial activities. They have also been used to treat some diseases like cancer, arthritis etc. They have been screened extensively to isolate life saving drugs or biologically active substances all over the world. Marine algal sources are receiving much attention mainly because of the contents of functional ingredients such as polyunsaturated acids, carotenoid pigments, sulphated polysaccharide and sterol. Among different compounds with functional properties, anti oxidants and antibacterials are mostly and widely studied. Marine species have been used in a wide array of traditional remedies and provided a good source of antimicrobial activity and promising source of natural products. Marine species have been used in a wide array of traditional remedies and provided a good source of antimicrobial activity. Seaweeds produce a great variety of secondary metabolites characterized by a broad spectrum of biological activities. The seaweeds have a unique place in traditional medicine of maritime nation as vermifuges, aesthetics and antibiotics in the treatment of cough, wounds, gout, goiter, hypertension, venereal diseases, cancer and a variety of other sickness. Compounds with cytostatic, antiviral, antihelminthic, antifungal and antibacterial activities have been detected in green, brown and red

algae Marine bacteria often produce anticancer and antibacterial substances as a means of maintaining relationships between epiphytic micro environments, inhibiting competing organisms and microbial pathogens. The production of microbial inhibitory substances from marine species has been carried out to identify novel antimicrobial compounds from marine sources Sea weeds and medicinal plants have unique place in the ancient and traditional medicine being a good source of antimicrobial potential with a promising source for natural products. Cow urine is a liquid discharge consisting of nontoxic waste material from the cow body. The main constituents of cow urine are Water: 95%, followed by Urea: 2.5%, and the rest 2.5% is a mixture of different minerals, salts, hormones, and enzymes. Antimicrobial and germicidal properties of cow urine are due to the presence of urea, creatinine, aurum hydroxide, carbolic acid, phenols, and salts of calcium, and manganese [1]Aspergillus niger spores if inhaled in large amounts causes Aspergillosis, a serious lung infection. [2].Species of Penicillium are recognized by their dense brush-like spore-bearing structures called penicillin some species produce toxins and may render food inedible or even dangerous. Saccharomyces is a genus of fungi that includes many species of yeasts. Saccharomyces cause food spoilage of sugar-rich foods, such as maple sap, syrup, concentrated juices and condiments [3].Aspergillus candidus is a fungus which is a common contaminant of grain dust and which causes respiratory disease [4].Therefore, the present investigation aims to study the antifungal efficacy of cow urine extracts of selected algae Kappaphycus alvarezii and Sargassum species . This assessment paved the path for the utilisation of these extracts to develop medicinal plant and algae extracts by making proper formulations with cow urine counter various infections caused by microbes, thus boosting the human

Objective of Study

Study of antifungal properties of cow wine extracts of saluted micro algae.

Material and Methods

Plant material

The Sea weeds, *Kappaphycus alvarezii* was collected from the seacoast of Rameshwaram, Tamil Nadu, India. The *Sargassum* species was collected from was collected from the sea coast of Kanyakumari and Ramanathapuram district of Tamil Nadu, India. The selected algae are used for experimental purpose and their bioactivity and identity was confirmed at Maharana Pratap University of Agriculture and Technology Udaipur. The algae samples were bought in the laboratories in sterile conditions and were dried and kept for a week in the sun and then were grinded to small powder.

Fungal and Bacterial Cultures

The test organisms, *A.niger*-MTCC 282,*A. candidus*-MTCC 1989,*S. cerevisiae*-MTCC 170 were obtained from Microbial Type Culture collection, Indian Institute Of Microbial Technology Chandigarh, India .

The cultures were allowed to grow on their respective selective media to check and ensure their purity and optimum growth before subjected to further analysis.

Preparation of aqueous sea weed extract: The aqueous extract was prepared by dissolving 4g of powdered sample was soaked in 40 ml of the solvents cow urine for 3 days. The remaining extracts were filtered and concentrated in a rotator evaporator .The vacuum pump was used to remove the residual water .The weighted crude extract were suspended in dimethyl sulfoxide (DEMSO) to a final concentration of 50mg/ml and stored in a refrigerator.

Antimicrobial Assay

1. Disc diffusion method

- i. Potato Dextrose Agar for fungus was prepared according to the accurate composition and immediately after autoclaving, it was cooled in a 45 - 50°C.The freshly prepared and cooled medium was poured into petri plates.
- ii. The agar medium was cooled to room

temperature unless the plate is used the same day; and stored in a refrigerator (4°C).100 µL of fungus from freshly prepared culture was taken in the pipette and poured in the middle of the respective petri plate. Using a cotton swab that has already put in UV light, the fungus was spread evenly on the surface of the plate so that fungus were spread in each corner of the plate and dried for 4-5 minutes. Using a flame - sterilized forceps the disc was dipped in the sample or antibiotics for 5-10 seconds. Each disc was then gently placed on the agar plate to ensure that the disc was attached into the agar. The plate was kept in laminar air flow for 30 minutes so that the drug was properly absorbed in the gel

- i. Plates were inverted and incubated for 3-4 days for fungus. Zone of inhibition is measured with the help of the scale and noted down.

Result

The cow urine extracts of *Kappaphycus alvarezii* (Red Algae), and *Sargassum* species (Brown Algae) were tested against *Saccharomyces cerevisiae*, *Aspergillus candidus*, *Aspergillus niger* and *Pencillium* Species.

The results of the antimicrobial activity of plant extracts tested against bacteria by disc diffusion method shown in Table -1..The assessment of the cow urine extracts of microalgae revealed that *Kappaphycus alvarezii* showed zone of inhibition 10mm against *Aspergillus niger* and 9mm .against *Sargassum* species The least inhibited isolate was by *Sacchromyces cervesaie* in both the micro algae species with (6.5 mm) as zone of inhibition *Aspergillus candidus* was inhibited more in *Kappaphycus alvarezii* (10mm) as compared to 6 mm in case of *Sargassum* species The *Pencillium* species showed remarkable inhibition in *Kappaphycus alvarezii* cow urine extracts (9.5 mm)and *Sargassum* species to be 10 mm respectively.

Discussion

The cow urine extracts of *Kappaphycus alvarezii* and *Sargassum* species possesses significant antifungal activity against pathogenic microbes .The cow urine

extract are future alternatives for fungal disease management. In the early reported papers, there are a number of reports which evaluated the antimicrobial properties of marine algae and but very few work was done on study of antifungal, cow urine extracts of *Kappaphycus alvarezii* and *Sargassum* species against *Saccharomyces cerevisiae*, *Aspergillus candidus*, *Aspergillus niger* and *Penicillium* species. The *Kappaphycus alvarezii* and *Sargassum* species revealed significant antifungal activity against all pathogens. The compilation indicates that cow urine extracts of *Sargassum* species and *Kappaphycus alvarezii* exhibit better antifungal action against different clinical fungal strain.. The algae cow urine extracts are sources for development of new novel pharmaceutical agents. The future research lies in utilisation of these extracts to develop algae and plant extracts by making proper formulations of cow urine extracts and to counter various infections caused by microbes, thus boosting the human immune system and development of novel drugs. This result indicates the enhanced antifungal activity of extract of cow urine in *Kappaphycus alvarezii* and *sargassum* species is due to phenolic content which restrains micelle growth because of presence of phenolic content of algae. [5] This inhibitory activity of plant extracts can synergistically can be used as precursors for the synthesis of useful herbal drugs. The production of microbial inhibitory substances from marine species have been carried out to identify novel antimicrobial compounds from marine sources, thus resolution to the growing crisis of antibiotic resistance and their side effects are the breakthrough for search of new antimicrobial compounds from natural resources. New antimicrobial compounds when projected to chemical analysis and biological assay have begun to play an important role in ethnobotanical studies. The cow urine extracts exhibit better antimicrobial action against different clinical microbial strains; hence can be utilised to control microbial infections. These products essentially help to identify newer structurally novel natural products with new modes of action and exhibiting antimicrobial activity.

Figure 1 : Disc diffusion results of *Sargassum species* against *Aspergillus candidus* and *Aspergillus niger*

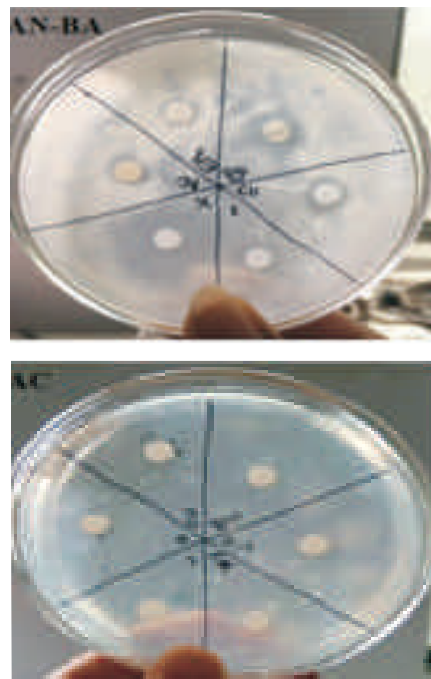


Figure 2 : Disc diffusion results of *Kappaphycus alvarezii* against *Aspergillus candidus* and *Aspergillus niger*

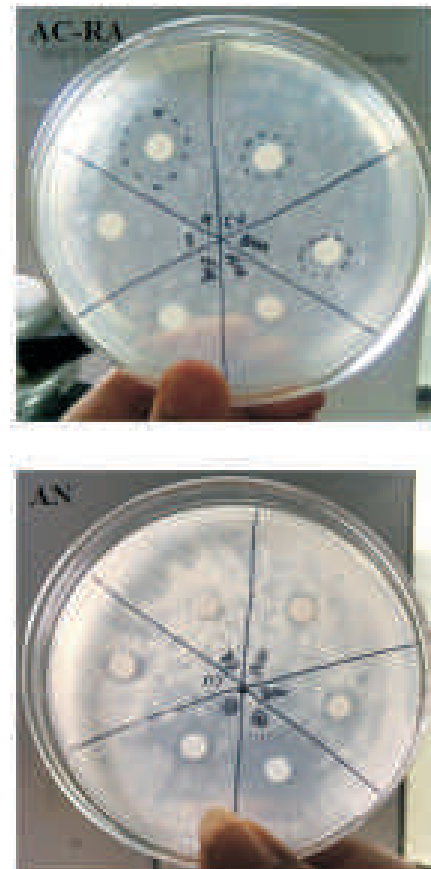


Figure 3 : Antifungal activity of cow urine extracts of *Kappaphycus alvarezii*, *Sargassum* species against fungi



Table 1 : Antifungal activity of cow urine extracts of *Kappaphycus alvarezii*, *Sargassum* species against fungi. *Saccharomyces cerevisiae* showed less inhibition (6.5mm) in *Kappaphycus alvarezii* and *Sargassum* species. *Penicillium* species showed 10mm in *Sargassum* species as compared to *Kappaphycus alvarezii* which showed 10mm in *Aspergillus niger* and *Aspergillus candidus*

Extracts	FUNGI	Cow Urine	Positive Control	Negative Control
<i>Kappaphycus alvarezii</i>	<i>Aspergillus niger</i>	10 mm	-	
	<i>Aspergillus candidus</i>	10 mm	-	-
	<i>Penicillium species</i>	9.5 mm	-	-
	<i>Saccharomyces cerevisiae</i>	6.5 mm	-	-
<i>Sargassum species</i>	<i>Aspergillus niger</i>	9 mm	20 mm	-
	<i>Aspergillus candidus</i>	6 mm	11 mm	-
	<i>Penicillium species</i>	10 mm	10 mm	-
	<i>Saccharomyces cerevisiae</i>	6.5	12 mm	-

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Integration of Web 2.0 Technologies in Banking in India

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Abstract

Web 2.0 technologies in banking sector are the generating new impulse for the advanced banking activities around the globe. The integration of Web 2.0 technologies benefits are not only restricted to the Banks but also offers several advantages to the consumers in terms of the ease and cost of transactions. Across the world, Banking industry is progressing with the wide stack of technologically advanced array of initiatives that took place to bold bets on Web 2.0 technologies including wikis, blogs and personal domains, mobile and handheld application, and social media platforms, which are dramatically altering the concept of attracting and retaining the customers with the particular service or banking end.

Web 2.0 is that the next step within the evolution of the net and whereas banks might take comfort in their incumbent advantage, technologically-enabled non-bank challengers are ramping up their capabilities in a very considerably quicker pace and are notably stronger these days, difficult the privileged access and relationships ancient dealing banks presently get pleasure from with their customers.

Quick moving computerized advances, unlimited versatile access and dynamic web-based social networking profoundly affect banks' online methodology with many are creating intuitive instruments that assistance clients break down their ways of managing money and fortify their cash administration abilities while some are preparing the influence of interpersonal organizations to assemble their brands and lure shoppers to share individual data. Web 2.0 innovations is set around this subject of satisfying the developing advanced needs of carefully keen age of coming age. Web 2.0 innovations holds awesome potential to grow item assortment and customization, quicken benefit conveyance, tap new pools of income and can also extend client connections that lift maintenance and gainfulness.

Yet, to a substantial degree the advanced pioneers and additionally banks that presently can't seem to cross the computerized Rubicon. It is the ideal opportunity for managing an account to deal with Web 2.0 and exploit the numerous open doors offered by the technological advancements with the

integration of lightweight handy applications activities which the consumer can perform through their handhelds.

This paper is an attempt to understand the technological and fundamental concept of Web 2.0 technologies as well as also present the benefits of Web 2.0 technologies if the technology is integrated with the conventional banking practices to the banks as well as to its consumer also.

Introduction

The World Wide Web consortium commonly known as the web cannot be present tantamount with the internet but must be understood and present as the prominent part of the internet and allied technologies which jointly develops the framework and architecture for the techno-social system through with humans and technologies interacts with each other over the technological networks. The thought of the techno-social framework alludes to a framework that upgrades human discernment, correspondence, and co-operation; it also expanded the reach and scope of the execution of a single technically rich process at distinct and parallel locations.

The time has come for banking activities or industry that it should integrate with Web 2.0 and exploits the numerous open doors promoting advanced and developed banking activities for consumers and banking sector executives. This will expect banks to reexamine their customary conveyance models, counting making new offerings and channels for more youthful client fragments, conceiving new items and administrations that are less difficult and more straightforward, and utilizing the energy of long range interpersonal communication and other computerized stages to enhance their advertising. The effort will constrain banks to better comprehend the genuine capability of Web 2.0 and figure out how to talk the dialect of the new age of Web-adroit clients. Achievement in the new Web 2.0 world will require a plainly defined system that incorporates

including the bank's clients in its advertising efforts, making a painstakingly mixed item portfolio with new section specific offerings, and putting resources into the Web 2.0 innovations required to pull the whole effort together.

The absence of dynamic collaboration of normal clients with the web prompts the introduction of Web 2.0. Web 2.0 or the "read-write" web can contribute content and connect with other web clients. This association and commitment has significantly changed the scene of the web. Web 3.0 as the web can be thought to be the following stage, where a labyrinth of utilizations cooperates homogeneously by brought together information arranged crosswise over web. It characterizes a blend of advances to structure information to be translated by machines themselves.

What is Web 2.0?

Web 2.0 is a term that portrays the changing patterns in the utilization of World Wide Web innovation and Website architecture that intend to improve inventiveness, secure data sharing, increment coordinated effort, and enhance the usefulness of the Web as we probably are aware of it (Web 1.0). These have prompted the advancement what's more, advancement of Web-based groups and facilitated administrations, for example, long range interpersonal communication destinations (i.e. Facebook, MySpace), video sharing locales (i.e. YouTube), wikis, websites, and so forth.

Despite the fact that the term proposes another adaptation of the World Wide Web, it doesn't allude to any genuine change in specialized particulars, but instead to changes in the ways programming designers and end-users use the Web. Web 2.0 is a catch-all term used to portray an assortment of improvements on the Web and an apparent move in the way it is utilized. This move can be portrayed as the development of Web use from detached utilization of substance to more dynamic investment, creation and sharing. Web 2.0 Websites enable clients

to accomplish something other than recover data. Presently clients can expand on the intelligent offices of Web 1.0 to give "organize as stage" registering, enabling clients to run programming applications completely through a program. Clients can co-creator the information on a Web 2.0 website and exercise control over it. These locales have an "engineering of investment" that urges clients to increase the value of the application as they utilize it. This stands rather than customary websites, which restrain guests to detached survey and whose substance just the webpage proprietors can change.

The term web 2.0 was recognized in 2004 by Dale Dougherty, vice-president of O'Reilly Media, in a conference brainstorming session between O'Reilly and Media Live International. It refers to second generation of the World Wide Web that is focused on the ability for people to communicate, collaborate and share information online. Web 2.0 is also recognized by tools like Wikis, Mash ups, blogs, widgets, RSS surveys and polls, offering an enhanced way to share information and with an enhanced stress on collaboration and usability. From being recipients of information, customers became active contributors to portal content Web 2.0 is also known the wisdom web, people-centric web, participative web, and read-write web. Web 2.0 is not only a new version of web 1.0; Flexible web design, creative reuse, updates, collaborative content creation and modification were facilitated through web 2.0. The characteristics of Web 2.0 include rich user experience, user participation, user interactivity, dynamic content and scalability. Web 2.0 Websites commonly incorporate a portion of the accompanying highlights/strategies presented in Table 1.

1. Rich Internet application (RIA) — characterizes the experience conveyed from desktop to program, regardless of whether it is "rich" from a graphical perspective or an ease of use/intuitiveness or highlights perspective.
2. Web-oriented architecture (WOA) —

Table 1: Web 2.0 features and techniques

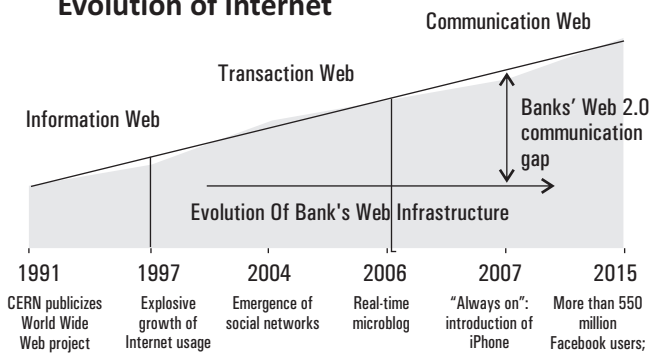
Features	Description
Search	The simplicity of discovering data through catchphrase seeking.
Links	Advisers for essential snippets of data. The best pages are the most much of the time connected to.
Authoring	The capacity to make continually refreshing substance that is co-made by clients. In wikis, the substance is iterative as in the general population fix and re-tries each other's work. In sites, it is aggregate in that posts and remarks of people are collected over time.
Tags	Classification of substance by making labels that are basic, single word portrayals to encourage looking and abstain from fitting into inflexible pre-made classifications.
Extensions	Automation of example coordinating for customization by utilizing calculations (i.e. Amazon.com proposals).
Signals	The utilization of RSS (Real Simple Syndication) innovation to make a membership display which informs clients of any substance changes.

Web 2.0 can be described in three parts:

characterizes how Web 2.0 applications uncover their usefulness with the goal that different applications can use and coordinate the usefulness giving an arrangement of substantially wealthier applications. Illustrations are encourages, RSS channels, web administrations, mashups.

3. Social Web — characterizes how Web 2.0 sites has a tendency to communicate considerably more with the end client and make the end-client a necessary piece of the site, either by including her profile, including remarks content, transferring new substance, or including client produced content (e.g., individual computerized photographs).

Figure 1: Gaps in Banking and the Internet Growth Evolution of Internet



Source: Strategy and Analysis

From the above figure 1 it could easily understand that the Internet has significantly changed numerous parts of doing banking activities: Online managing an account and, online bill payments, installments payments and many more activities but banks presently can't seem to make full utilization of the Web till digital age. It is the ideal opportunity for them to exploit the tremendous capacities and characteristics of Web 2.0 advances offerings, and to do as such soon as customer inclinations change quickly.

To integrate the advancement and offering of the new technology age banks must develop new model for their information technology integration especially technologies such as Web 2.0 encompassing entire banking system such as segmenting through new digital natives identification, channelization by offering always on mobile linked services like peer supported advice, product customization through new more advanced and web oriented service infrastructure development with the advanced advantages, and marketing to stay connected with the clients with digitally on architecture.

Web 2.0 Technologies and Banking Industry

We are currently living in a time of digitization, possessed by the advanced locals of Generations Y and Z. Age Y witness the consistent nearness of PCs at home and access to more than 250 satellite TV slots. Then again, Generation Z appreciates high access to web innovation from birth and is considerably more acclimated with it.

Desires of clients have changed with the mechanical progressions in Internet and broadcast communications Facebook, for example, has gained more than 550 million clients, 200 million of them on cell phones. Different destinations and administrations, for example, Twitter, LinkedIn, and Xing, are additionally extremely well known, truth be told, various ventures have as of now effectively joined Web 2.0 into their circulation models: Web 2.0 can contribute bigly as Banking industry moves towards a "Client Inside" culture where clients can cooperatively contribute with banks to make items and administrations to live up to their desires. Banks, along these lines can pull in more clients and enhance client unwaveringness.

Web 1.0 could be considered as one way "informing" while with Web 2.0 in the managing an account world, two-way correspondence is set up and clients are enabled to speak with their bank and additionally between peers. A magnificent Web 2.0 case in the managing an account industry is www.kiva.org, a socially capable shared miniaturized scale back supplier to poor people. Outside the managing an account industry there are numerous fruitful cases of organizations who utilize Web 2.0 as Wikipedia, Twitter, Facebook, Myspace. Extensive variety of apparatuses and procedures that develops with Web 2.0 is being utilized crosswise over industry Verticals for different purposes. Gadgets, RSS, wikis, blend, writes, studies and surveys are the most ordinarily utilized Web 2.0 instruments by associations.

Table 2: Web 2.0 instrumentation

<p>Blogs</p>	<p>A weblog is a page that fills in as an openly available individual or gathering diary for an individual or a gathering." Blogs are labeled, and accordingly sorted, and guests can make remarks on a blog passage, in this manner building up correspondence, trading thoughts and conclusions amongst bloggers and their perusers. Offering the</p>
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	<p>perusers to make remarks on blog sections, the blogger is for all time open to correspondence, which is a standout amongst the hugest parts of blogging society. It can be utilized by foundations to make an open mindfulness about another administrations and items being taken off to their clients. Websites are a forceful way to deal with lead age by composing first class online substance, For example California Bank and Trust has an incredible week by week blog covering a wide traverse of business keeping money points, for example, digital security, hazard administration, vitality investment funds, and merchant administration. Another occasion is of First Bank and Trust which distributes their Banking and Financial Education blog on an assortment of managing account subjects, with a particular turn toward business and business saving banking.</p>		<p>remark with respect to items and administrations, and these thoughts are in this manner passed on to item administrators or potentially administration for thought.</p>
<p>Wikis</p>	<p>Wikis can be utilized by banks to develop an information entrance, to make mindfulness on managing account ideas. Wikis can be useful in thought sharing among the diverse banks. Wikis give research and understanding from greatest resources cap is colleagues of any bank. The additional esteem is that the end clients are acquainted, and they are most appropriate to create and alter content. Most web clients would know and have utilized Wikipedia, which is a magnificent case open source cooperation to make learning. Individuals may contribute and alter a thought or</p>	<p>Social Networking</p>	<p>Web-based social networking apparatuses are picking up ubiquity and are progressively utilized as a part of consistent operations of many banks .Social media can be utilized by business people to make a bank which utilizes the innovation to defeat the cost and multifaceted nature of customary managing an account, while expanding client trust through an online group. for example Wells Fargo in the U.S. is an early adopter of long range informal communication locales like Face book and Twitter to associate with its clients.</p>
		<p>Mashup</p>	<p>The term concoction alludes to another type of Web-based applications made by software engineers to blend no less than two unique administrations from divergent, and notwithstanding contending, Web destinations. The fundamental qualities of a mashup are mix, perception, and conglomeration. A concoction, for instance, could overlay movement information from one source on the Internet over Google maps. Banks can utilize mashup to give branch/ATM locator administrations by means of Internet or portable. Mashups can be utilized to demonstrate an examination of the administrations or rates gave by various Banks to home credits or stores, enabling clients to pick the best accessible alternative for them.</p>

Widgets	<p>Widgets are little application with restricted usefulness that can be introduced and executed inside a website page by an end client. A gadget is transient or helper application, implying that it just possesses a part of a site page and accomplishes something valuable with data brought from different sites and showed set up. Different terms used to depict web gadgets include: port let, web part, contraption, identification, module, scrap and drop. Gadgets are regularly made in DHTML or Adobe Flash. It can be intended to show account adjusts, smaller than normal explanations and give reserves exchange/charge installment abilities.</p>
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Source: Author's Compilation from several web sources

Web 2.0 technology benefitting Banks

1. **Cost of Sales** – Web 2.0 lets banks sell its complex products easily on low cost online channels, reduces the need for consultants and eliminates the need for back office.
2. **Customer Experience and Loyalty** – Web 2.0 enhances client correspondence and gives more prominent client accommodation by diminishing the trouble looked by the clients and even by the keeping money work force. This in the long run builds the dedication of clients towards the bank.
3. **Customer Interaction** – Web 2.0 makes a decent connection among bank clients and enables them to know each other. This builds offers of bank items as clients put stock in additional on counsel of different clients.
4. **Bank Accountability** – With expanded client network, a solitary disappointed client can make an incredible damage to bank's notoriety. So banks must be more mindful in their dealings with the client.
5. **Better Client-portal design** - Web 2.0 ideas may enable firms to better work together inside and remotely on information administration and issue determination. A few new parts can be included into the server side and the program side. On the server side, the Channel Handler should bolster correspondence with the program through the XML or JSON information formats. With the two sorts of organized information, the demand and reaction between the server and customer will have more substance and importance. Additionally, there would be some fascinating potential outcomes for enlarging the conventional help from wikis.
6. **Fast Delivery of Information to customers, partners and employees** – Web 2.0 innovation empowered managing an account framework can be viable in conveying data more responsive, convincing and successful than at any other time. Web 2.0 can possibly affect all features of saving money industry, from client self-support of process administration dashboards. In a client confronting situation, the key favorable position is to separate brand and convey connecting with client encounters online with a definitive objective of expanding selection of online administrations. In different situations, the essential advantage is to quicken and enhance basic leadership by conveying data that is both natural and outwardly rich.
7. **Customer Relation management** – Banks are attempting to enhance how they draw in clients web based amid the item research and choice stage. There are abundant cases of Web applications which give item selectors, retirement number crunchers and guided counsel that are helping establishments to separate themselves on the web. For various clients, distinctive customized Internet

managing an account exchange and advertising stages can be shown. Clients can uninhibitedly redo the data and budgetary administrations that intrigue them. Various Banks can be seen utilizing rich Internet applications as the front end to computerizing key client driven procedures, for example, account opening and advance start.

8. **Rapid application Development** – Web 2.0-based Internet managing an account can advantageously coordinate some outsider administrations, for example, Google Maps, Yahoo Stocks, climate figures, budgetary news, et cetera. These administrations can be joined together into a mashup application which gives clients esteem included administrations and upgrades the client encounter. The Web 2.0 based can, bolsters multi-benefit windows and every window underpins offbeat simultaneous operation.

Web 2.0 Security Challenges

Programmers have abused Web 2.0 to dispatch worms that execute destructive operations outside the program, leaving clients unconscious of their exercises. They likewise transfer true blue looking vindictive substance to informal organizations. This could happen, for instance, in the event that somebody went to a wiki connecting to code that should be infection evacuation programming yet that rather stacks a Trojan steed. The unsafe code could incorporate key-loggers that catch casualties' keystrokes—including those utilized for bank and Visa numbers and passwords—and send them to the programmer. The code could likewise transform casualties' machines into remote-controlled zombies that programmers could use to dispatch spam, foreswearing of-benefit, or on the other hand different assaults. Programmers exploit a few Web 2.0 components and applications.

Some of the threats associated with the Web 2.0 technologies are as follows:

1. **Fear of change** - Aside from internal Web 2.0 tools and practices (e.g., websites and wikis) there are significant reception challenges with other web 2.0 devices like RSS, Mashups, Folkonomies. Maybe because of their customer to shopper starting points, informal communication locales, web journals are more typical in managing account organizations than others.
2. **Where to invest** - A right blend of web 2.0 tools to be conveyed in banks is frequently a major test for the administration as it must be a correct blend for the correct bank and furthermore giving preparing to the staff individuals about web 2.0 applications is likewise expensive.
3. **Security Privacy and Legal Challenges** - Web 2.0 depends on clients contributing the majority of the information surely raises a few issues. Web 2.0 innovation likewise powers the wide zone of data fighting. Web 2.0 applications contain no arrangement for observing substance or activity to guarantee that delicate data isn't being transmitted improperly. In the event that any firm, in any industry, chooses to let its representative's blog openly, they have to first consider the dangers and make cautious strategies. Blogging has turned out to be regular in the innovation business, and each significant innovation firm that conveys along these lines, has very much made blogging arrangements set up.

Some of the typical attack techniques in Web 2.0

1. **XSS** – Programmers infuse their claim executable code into existing, true blue, progressively produced Website pages. At the point when somebody downloads the page, the installed programming goes with the asked for page and can execute on the client's PC.

2. **CSRF** – A programmer picks up access to a clueless client's PC and sends unapproved solicitations to a web based business or other Site to which the casualty has been validated. The programmer can likewise send demands by means of the client's PC to an organization intranet to which the casualty approaches, in this manner bypassing firewall assurance. To validate and in this manner pick up access to a Web website or corporate intranet, a programmer utilizes either the traded off PC's IP address or on the other hand treats that the site set on the machine. This empowers the programmer to go about as the PC's proprietor and start hurtful moves, for example, making cash from the individual's bank account, requesting items from an online business website, taking information from an organization intranet, or changing settings on a nearby firewall or switch.
3. **Dynamic code obfuscation** – Programmers now and again hide the marks by means of dynamic code obfuscation. DCO utilizes calculations to include arbitrarily produced code to a JavaScript-based Web page that incorporates malware. The code doesn't influence the way programs render the page and doesn't make the vindictive code the page contains less destructive.
4. **Web 2.0 worms** – Web 2.0 worms can engender in the foundation of a client's program without being shown in an open window in the event that somebody visits a contaminated site. Such worms have tormented major Web 2.0 destinations, for example, MySpace and Yahoo! Mail.

Conclusion

Web 2.0 accompanies numerous open doors and with time, what is sure, is that Web 2.0 will markedly affect the keeping money industry and have the capacity to lift saving money administrations and offerings to

extraordinary statures. The client will be the greatest recipient of this change as far as enhanced access to the correct items, enhanced perceivability of related expenses and expanded choices to contrast moneylenders with settle on ideal choices. Saving money organizations can likewise yield from Web 2.0, by having the capacity to use productive channel abilities, decrease promoting expenses and construct the correct client base in accordance with their individual procedures. With Web 2.0, managing an account information will change to a firmly coupled framework that empowers more noteworthy trade of data amongst banks and clients. Indian banks, for example, SBI, ICICI have demonstrated nearness on long range informal communication locales however with less action and client nearness. Additionally none of the Indian banks have indicated contribution in keeping up web journals or joining some other component of a web2.0 bank. So Indian banks still have far to go to end up web 2.0 banks .They have to investigate all roads gave by web 2.0 and need to expand client mindfulness and support.

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Cloud Computing in Education System

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Abstract

The information technology culture to deliver more promising, reliable and scalable services is now not limited to the business enterprises, but also spreading the wings towards the academic institutions as well with the fundamental featured advantages of cloud architecture. Use, availability and accessibility of cloud services are exponentially improved and due to this significant move and multi-fold growth is been observed in the numbers of businesses and academic institutions which are now days using the cloud services. With the help of cloud computing providers, businesses and higher educational institutions (Universities) can go for migration of their data and information through selective 'cloud' service providers with existing data centers, servers and applications which may lead to replacement of traditional campus system, database architecture, software platforms, computing capabilities, infrastructural independence etc.

Many academic institutions or higher educational bodies have recognized the potential advantages of leveraging cloud service either as economic value addition or as technical infrastructure value addition as well as for more advanced teaching and data sharing tool. Integration of cloud computing into the educational system mitigates several issues related to the IT infrastructure development in any institutions such as costly hardware infrastructure, software infrastructure cost, electricity bills, personnel staffing and their salaries, maintenance of computer resources and many more. Apart of the tangibles benefits the cloud services can nourish the overall efficiency of the educational system by offering other intangible benefits such as advanced data security features, virtualization, centralized data storage and retrieval, better control and command over the data accessibility, monitoring over data from central system and many more.

Keywords: Information Technology, Virtualization, Cloud, Economic Value Addition

Introduction

The concept of Cloud Computing is not that much new as it seems to be, it is so because in the first evolution era of the internet and related technologies it was one the fundamental aim of computer science branch that computing and related technologies should be organized in such way that it can become publicly

accessible. The term 'Cloud Computing' is a metaphor paradigm in which available resources, services, software and information become accessible for or shared for open access or restricted access by its users. In the cloud architecture a combination of logical and technological framework is developed for the purpose of integrating all kind of products and services available over the internet in order to attain the customized service delivery to its users.

On the basis of the four layered architecture of cloud computing model entire services for the educational system can be classified over the model basis:

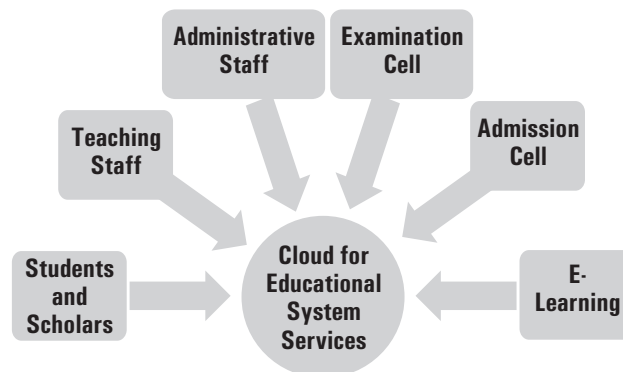
1. **Infrastructure as service – Infrastructure** – Entire educational system can be run over the cloud infrastructure.
2. **Software as Service – Software** – Access to advanced and upgraded software become easy. Developed solution can be attained for complex applications through cloud developed applications.
3. **Platform as Service – Platform** – Educational System platform can be improved and upgrade to the advanced level without any hassle.
4. **Computing as Service – Computing** – Educational system can work with online examinations, ERP based services, E-learning, distance learning mode, virtual classroom and may more without thinking of their systems' processing and computing capacity.

Overall the cloud service model offers several benefits of adopting cloud computing in educational system such as low cost, improved performance and efficiency, easy and advanced instant software updates and improved document format compatibility and data security. Additionally, it provided many benefits for students and teachers, such as online courses, exams, assignments, projects, feedback, forums, and e-learning content and resource management. Cloud services and computing capabilities enable users to control and access institutional information through the channel

of Internet and the main users of a typical higher education cloud includes such as Admin department, students, Faculty, administrative staff, Examination Branch and Admission Branch. [1] Several companies including are accelerating delivery of cloud-based education systems to educational institutes as a way of generating future business, and several learning management systems are also now supporting cloud-based educational services. Although much work has been done to date with regard to adopting cloud computing for educational systems, further studies need to be conducted to develop more diverse forms of cloud-based education systems, in more innovative and efficient ways. Meanwhile, most of the current cloud-based education systems are concentrating on delivering and sharing learning materials and teaching activities, rather than constructing and supporting an integrated, total cloud-based educational environment.

Individual and secure login for restricted accessibility is provided for all the users of cloud on the basis their respective work and jobs assigned to them. Academic staff members can upload their Tutorials, assignments, and tests in any format either audio, video or document on the cloud server which students can access without any time restriction through Internet and their computers and other electronic devices both at home and college in 24X7 environment. With the help of cloud enabled education system, for faculty members it would be possible and convenient to identify problem areas in which students tend to make mistakes or having problem in classroom

Figure 1: Cloud for Educational System Services



methods of teaching, by analyzing students' study records and frequency of attempting the assignme-

Table 1: Stakeholders of Cloud Computing System in Educational System

Cloud Service	Stakeholders (Users)
Infrastructure as a Service (IaaS)	Developers, Server Administrators, Research Scholars, Networking Administrators, Examination Cell etc.
Software as a Service (SaaS)	Students and Scholars, Administrative Department, Faculty members, Examination Cell, Admission Cell, Library Staff, IT lab etc.
Computing as a Service (CaaS)	Server Administrators, Research Scholars, Networking Administrators, Database Administrators etc.
Platform as a Service (PaaS)	Technical team, Server Administrators, Administrative Cell, Database Administrators etc.

Source: Author's Compilation through available Literature

Cloud Computing Design Of Education System

Cloud computing characteristics such as higher accessibility and improved retrieval rights, data security features, time independent availability of resources, efficiency of cloud services, free or with less fee and improved functional and operational characteristic services of cloud services many academic institutions and organizations are making efforts to use the service through cloud architecture to earn all the tangible and intangible benefits of cloud. The cloud service not only make the accessibility of

data and services at location dependent platforms but also offers location independent accessibility of data and services for all the stakeholders of institutions or organizations through intranet platform and internet platform both. Integrating the cloud computing systems and services reduces the cost of functional and operation activity of the institutions because servers and data or information materials are shared.

Structuring cloud service architecture for educational system looks for the several unique characteristics as

per the purpose, requirements and existing information technology infrastructure or architecture of the university or institution, some time it may be very crucial and challenging. In order to developing a fully functional cloud architecture for the universities or academic institutions, they has to follow all the legal policies and framework designed for cloud by the state and country, especially for developing a cloud service architecture for education because it will perform the cross broader transfer of information. Once the academic institution set up own information technology architecture to define that where their data will reside and also ensures the measurements of data security and privacy through the Service Level Agreement with the cloud service provider, only after that the data migration can be initiated and all should be followed under restricted legal provision of IT act of the state or country. The agreement confirms that educational cloud users regarding the services provided by the cloud. It tries to identify the users need and simplifies complex issues and creates a relationship between the user and the service provider. It helps to specify the privacy, consistency and integrity.

Data Security and Privacy are the two quite important factors which should be under consideration and must be handled with rigid policies before migrating towards cloud computing. It may be possible that as the service provider cloud may ask for some personal information and that may be related to the dataset or private information on what the client is looking for to accumulate in the cloud database. So institutions and organizations should be very careful before presenting their personal and confidential data under the certainty of security measures and it should also confirm that data or information should not lose its integrity. Several active strategies, practices and solutions can be ascertained which can ensure the security and protection of sensitive data in the cloud. Some of them are as follows:

1. Masking of data

2. Encryption and Decryption
3. Password Protection
4. Authorization and Identification
5. Firewalls
6. Grants and Roles
7. Syntax Translation

Such stated above schemes can be followed to ensure data security and privacy. Most commonly followed schemes for data or information protection are firewall, passwords and cryptography. In the development process of a cloud several stakeh-olders and information technology elements participate to make a cloud structure compatible to institutional need or the industry need. According to the own institutional need and to cater the stakeholders of the particular institute or affiliated institutes if institutes develops their own cloud then it would be called as "Private Cloud" and if the multiple institutes of different umbrella come altogether to develop and hybrid and full functional cloud then the developed hybrid cloud would be called 'educational cloud', in which participated institutions can share all the their resources to develop a full operational cloud with all the possible solution of education system.[.3] Private cloud network integrate the local networks whereas the educational cloud integrate public networks to access the services provided by the cloud. Both private as well as educational cloud developed for education system has to stipulate the services provided by them.

On the basis of Table 2 presented above several dissimilarities in between private cloud and educational cloud can be observed which are as follows:

1. Private Clouds are owned and managed by a particular university and its affiliated institutions but the educational cloud are owned and managed by multiple numbers of universities and other academic institutions.

Table 2: Cloud Architecture for Education System

Cloud Users	Type of Cloud	Cloud Services
All the stakeholders of the Education System such as Students and Scholars, Administrative Department, Teaching Staff, Examination Cell, Admission Cell, Library Staff etc.	Private Cloud	Software & Hardware Services, Computing Services, Storage Services, Assistance Services, Infrastructure Services etc.
Institutions of any type such as Higher Educational System, Universities, Technical Colleges, Training Institutes etc.	Educational Cloud	Software & Hardware Services, Computing Services, Storage Services, Assistance Services, Infrastructure Services, Platform Services, Processing

Source: Author's Compilation

2. Access to private cloud is limited to employees and students of single university and its affiliated institutions but the access to the educational cloud is through subscription means it supports cross boundary institutional integration.
 3. Private clouds are controlled and customized by a single university and its affiliated institutions but educational cloud is controlled and customized by the industry standards and legal framework of the state and country.
- Functions that can be used in the cloud IaaS, PaaS, SaaS and CaaS, which plays significant role in developing such system. The features are enumerated below:
- 1. From IaaS platform standpoint –**
 - a. Integral development of learning resources with industry standard
 - b. Storage of learning resources and material for the full-fledged learning system
 - c. Learning system users monitoring and balancing
 - d. Scaling administration of virtual systems
 - e. Backup and restore of learning material and resources
 - f. Industry standard learning architecture development
 - 2. From SaaS platform standpoint –**
 - a. Application software repository with user friendly accessibility
 - b. Application registry administration
 - c. Application server administration for subscribed learning of the contents
 - d. Integral and authorised accessing of managerial applications to the users
 - e. Remote and virtual desktop deployment for personalized and customized application support
 - f. User based session administration and subscription
 - g. Central software upgrades and user rights administration

3. From PaaS platform standpoint –

- a. Training and administration of technical team
- b. Server Administration and maintenance for smooth functioning of services
- c. Advanced database administration for secured and consistent retrieval of data
- d. Standardized platform development and load administration
- e. User and scaling administration
- f. Centralized platform administration and application, service management

4. From SaaS platform standpoint

- a. Simultaneous load balancing in online examinations and learning resources management
- b. Institutional database management with fast retrieval
- c. Better server application management for learning resources and examinations
- d. Fast computing assistance for research scholar
- e. Regulated network architecture at central level
- f. All subscriber data held on SaaS server so better security and privacy measures must be ensured

Conclusion

Components of cloud computing in education system can include multiple contents related to information technology and education system of multiple formats such as management of the educational service experience, and development of an online community of learners and contributors, content developers and experts. With all the stated characteristics and functionalities of Cloud, higher educational institutions and universities can gain significant flexibility and promptness for the data with the universal availability of their data with security either it is sensitive.

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Relative Assessment of Open Source Software for Cloud Computing Platform: The Stack War

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Abstract

Cloud computing represents the services which are hidden and enclosed by a network element known as cloud. It engages arrangements of groups of remotely located servers and software service set of connections that allow uploading of various types of data sources for real time processing. Cloud computing allows sharing of resources to achieve consistency, maximize the utility and effectiveness of that resources which are shared not only by multiple users but also dynamically reallocated on demand over a network. The Service oriented architecture has been adopted by cloud computing through which user can break their problems into services; that can be integrated to make available solutions. Cloud computing offers its applications and services in terms of several fundamental models such as Infrastructure as a Service, Platform as a Service and Software as a Service. The deployment model of cloud computing includes types of cloud computing which are Private Cloud, Public Cloud and Hybrid Cloud. There are many open source software available which is use to deploy public or private cloud, some are OpenStack, Eucalyptus, Cloud Stack, Nimbus, Open Nebula and so on. The particular study, presents the details of the open source software such as OpenStack and Cloud Stack for cloud deployment. It is believed that the comparison obtainable in this paper would help developers in selecting most excellent open source software.

Keywords: Cloud Computing, Cloud Services, Open Stack and Cloud Stack, Cloud Implementation

Introduction

CLOUD is shortened for "Computing Location Independent Online Utility that is available on-Demand." Cloud computing provides varies services through a network element which can hide and cover that services by cloud. Cloud computing improves the efficacy and reduces expenditure of computer

resources by deploying groups of remote servers and software networks that allow uploading of various types of data sources for real time processing. Cloud computing allows sharing of resources to achieve consistency, maximize the utility and effectiveness of that resources which are shared not only by multiple users but also dynamically reallocated on demand over a network. The term moving to cloud refers to the shifting of organization from a traditional CAPEX model to the OPEX model which means use a shared cloud infrastructure and pay as one uses it instead of buying the committed hardware and depreciate it over a phase of time. The cloud computing allows organization to improve manageability with less maintenance and avoid infrastructure costs to get their applications up to mark quickly. There are many organizations like Google, Microsoft, Salesforce.com and many more who are presenting services through cloud. Virtualization is the most significant technology of cloud computing. Basically, virtualization is software which is used to split physical computing device into one or more virtual devices and each device can be easily used and managed to achieve computing tasks. "There are lots of tools and technologies which have been provided by cloud computing; that help to build parallel applications with much more affordable prices as compared to the traditional parallel computing techniques. Cloud computing put forward its services according to several fundamental models which are Infrastructure as a Service (Virtual Machine, Server, Storage, Load Balancers, Network etc), Platform as a Service (Database, Web Server, Development Tools, Execution Runtime etc) and Software as a Service (CRM, Virtual Desktop, Email, Games, Communication etc).[1]" The deployment model of cloud computing includes types of cloud computing; the primary types of clouds are Private Cloud (for a single organization), Public Cloud (use openly and publicly, ex. Microsoft's Azure ExpressRoute and Amazon's AWS Direct Connect) and Hybrid Cloud (composition of two or more clouds ex. IT organizations). The other types of clouds are Community cloud (shares

infrastructure between several organizations from a specific community), Distributed cloud (run at different locations, ex. BOINC, Folding Home and Cloud Home), Intercloud (cloud of clouds), Multicloud (multiple services in a single heterogeneous architecture). Fundamentally this research paper presents the comparison among the two-open source software for cloud implementation that are: OpenStack and Cloud Stack.

Open Source Cloud Platform

The open source community provides various open source software which are based on Software-as-a-Services; particularly for small businesses and enterprises with many qualities like low-cost applications, eliminates the hassles of deploying software on their own servers. The primary focus of open source projects is; on developing the management software and infrastructure for cloud computing. The open source cloud computing tools are used by both public cloud computing providers and organizations having private and hybrid clouds.

A. OpenStack

OpenStack is an open source tool for enterprises and developers which has been founded in July 2010 and it comes under the category of infrastructure software. OpenStack is the most important operating system independent technology and there are over 190000 individuals around 144 countries worldwide which have been adapted to this infrastructure software and it is very popular among IT manufacturers and IT vendors. OpenStack provides IT environments for public, private and managed infrastructure and helps organizations to build their own private clouds. OpenStack also helps IT providers to build their own cloud platforms; for example, Deutsche Telekom uses it. There are various other open source technologies like Cloud Foundry and Docker which are delivered via OpenStack because only few developers have direct contact and access of OpenStack APIs. These OpenStack APIs help developers to build their applications directly on top

