Information Technology Essay, Research Paper

Information technology is a rapidly growing

part of today’s society. It affects everyone’s life in many aspects.

Every human endeavor is influenced by information technology and the increasing

rate at which what it can perform includes. One area of human endeavor

that information technology has greatly influenced is the practice of medicine,

specifically veterinary medicine. Not only has veterinary medicine

been influenced by information technology, it has also been enhanced by

it. The degree to which the practice of veterinary medicine includes

information technology is observable at the Animal Emergency Clinic of

Central New York on Erie Blvd. in Syracuse, New York.

Section I: veterinary medicine.

Doctors of veterinary medicine are the

people who engage in the human endeavor of practicing veterinary medicine.

The activities that are included in this endeavor are the prevention, diagnosis

and treatment of animal diseases. The best way to handle a disease

is to prevent acquiring it altogether. To accomplish this animals

are given the available vaccinations for the most likely diseases they

would get according to what type of animal they are and where they live.

Unfortunately not every disease has a vaccination and not every animal

has the opportunity to receive the available vaccinations. When an

animal gets sick it is the duty of the veterinarian to determine the cause

of the sickness and the best possible course of treatment for it.

Veterinarians have many other responsibilities as well. These range

from, but are not limited to, treating wounded animals and spaying or neutering

them to preventing the spread of diseases from animals to humans through

agriculture.

The first school of veterinary medicine

was in France. It opened in 1761. Veterinary medicine schools

started to open in the United States of America during the civil war.

(www.encyclopedia.com)

To become a doctor of veterinary medicine,

DVM, one must complete veterinary school. To get accepted into a

school of veterinary medicine, a student has to meet the requirements of

that particular vet school. Most of the requirements can be satisfied

through undergraduate course work. The hard part is to have done a better

job at meeting these requirements than the competition has.

As an undergraduate, the student

must demonstrate not only academic excellence and dedication to service

and helping others, but also a vast repertoire of experience in the field.

To prove that he/she is truly dedicated to the service of others, community

service must be done and documented. Working, volunteering

and interning are all acceptable ways to gain experience in the field of

veterinary medicine. The reason behind schools requiring experience

is to ensure that the student knows what they are getting into before they

spend thousands of dollars (approx. $20,000/yr.) and at least four

years of their life in an extremely intensive academic environment.

Many people have an altered idea of what being a vet is about. A

lot of physical and emotion endurance is necessary to be a successful veterinarian.

Many people are unaware of that.

The specific undergraduate course requirements

to get into a school of veterinary medicine vary between the schools.

All of them are science intensive. Most require a well-rounded education.

The University of California at Davis school of veterinary medicine requires

one year of general biology, one year of general chemistry, one year of

organic chemistry, and one year of physics as far as lower division requirements.

Upper division requirements include a semester of biochemistry, a semester

of systemic physiology, a semester of vertebrate embryology, and a semester

of genetics. On top of that they want their applicants to have taken

courses in English composition, humanities, social sciences as well as

statistics. Simply taking these courses is not enough, they need

to be completed with a GPA above a 2.5. However, the competition

has an average GPA of 3.45. The GRE must also be taken and a competitive

score must be achieved for consideration. Tuskegee University requires

two semesters of English, two of math, two of chemistry (Enough to include

organic. Which really means four), two of physics, three of biology,

two of animal science, one of animal nutrition, and then courses in humanities,

social sciences and electives. They add that grades less than a c

are not acceptable.

Once a student has meet all of the undergraduate

requirements and has been accepted into a school of veterinary medicine

he/she still has the hard part to look forward too. It has been said

many times that vet. School is harder than med. School. The course

work is extremely intensive and demanding. Not everybody makes it

through. Nobody becomes a vet. for the money because what one must

go through to become and be a vet. is not worth it. That is why veterinarians

are so dedicated to what they do.

In order to keep up with new findings

veterinarians must continue to take courses so they can learn new findings

that have occurred since they were in vet. School. To keep up with

the competition veterinarians must stay current when it comes to technology.

This also allows them to be aware of the most efficient and effective ways

available to treat their patients. Short courses are offered to veterinarians

on such changes. Since medical discoveries have been and still are

constantly being made, and technology is always advancing, veterinarians

have always had to continue their learning of information. The only

difference over time is the actual material that they are learning.

Section II: Information uses and needs

in the practice of veterinary medicine.

There is a lot of information that doctors

of veterinary medicine need and use in the process of preventing, diagnosing

and treating animals. The courses they are required to take account

for a lot of the information they know and bring to work with them every

day. They have to know the anatomy of the normal canine

locomotor system and a normal canine head. The structure and function

of the cardiorespiratory system as well as the urinary system is imperative

information. So are parisitology, epidemiology, virology, bacteriology,

and mycology. Principals of nutrition and behavior come in very handy

when trying to determine the cause of distress in an animal. Immunology

is necessary when it comes to routine vaccinations, auto immune reactions

and pathogenic responses. Even veterinarians who do not perform surgery

must retain information on anesthesiology since it is sometimes necessary

for other procedures. In order to correctly prescribe medicines they

must have information on pharmacology and toxicology. Physiological

chemistry and correct pH balance of body fluids is another must.

So are many other areas that cannot be seen by the naked eye like cell

and tissue structure and function, endocrinology, metabolism. Then

there are other specific areas that all veterinarians must know information

about such as oncology and neurology. Much of this information is

gained through traditional textbooks and lectures. A great deal of

it, however, is made tangible through advances in technology. Cornell’s

school of veterinary medicine has modular research centers, MRC, which

greatly enhance what a vet. Student reads in a book. Cornell also has computer

labs that simulate a variety of systems and processes that go along with

what a student hears in class or reads in a text.

Fortunately for the clients veterinarians

are required to study ethics and issues in veterinary medicine. Veterinarians

must also know how to properly handle animals in order to prevent injury

to them and the animal. The rest of the information that veterinarians

need in preparing to practice comes from in-clinic experience. This

is a required part of vet school. These experiences may be gained

in small animal practices, on farm, in an equine practice facility, a zoo,

or even in a wildlife rehabilitation center. Many veterinarians learn

information on food animal practice to prevent disease spread to humans.

The information a veterinarian gains cannot be summed up in any paper.

All of the knowledge they have prepares them to practice veterinary medicine.

As they continue in the field they must continue to update their knowledge

with new findings as well as procedures that change as a result of the

change in technology.

When it comes to performing a diagnosis

and treatment of disease in an animal, a vet. needs to have all of the

above information understood, but he/she also needs information on the

patient. A lot of this information is gained from simply asking the

caretaker of the animal questions regarding the behavior and diet of the

animal. The majority of it comes from the vet’s own investigating.

This usually includes looking at the animal’s medical past, weighing the

animal and when necessary performing the tests relative to the symptoms

of the animal. These tests may include, but are certainly not limited

to blood tests, urine tests and even radiology. The use of an idexx

machine helps a great deal with blood testing. An IV pump machine

does a lot of the work when it comes to monitoring and maintaining an animal.

The office at which all of this takes place

must be set up in a very specific manner in order to accommodate all of

the needs of practicing veterinary medicine. It must be equipped

with the necessary testing equipment as well as the obvious, phone fax,

voice mail. And, of course, a way to keep track of the patients and

clients information, such as, names addresses, medical past and services

rendered to ensure proper charging.

Section III: Modern information technology

and the use of information.

Walking into one of the MRC’s is similar

to walking into a zoo in the sense that such a wide variety of animals

in different states can be found there. None still alive, but most

preserved in such a way that they can be touch and handled for examination

and comparison without deteriorating. One specimen, for example,

is a dog’s head sliced vertically from the ear to the neck. This

allows students to see and feel what it is like inside of a dog’s head

and what a normal brain appears like. The next specimen looked similar

except for minor differences in the brain. A student who studies

this now knows, thanks to technology, what a to expect if a dog comes into

their clinic with the same condition. This MRC also contained healthy,

injured, diseased and deformed skeletons of many species. Before

these labs came about vet. students really were unable to gain such experience

before they began their practice.

Another lab, which contains computers,

hasa station for different aspects of studies ranging from metabolism to

oncology to cell physiology. On each computer was a simulation relative

to the area of study it specialized in. These computers are a great

resource for trying to understand systems and processes that cannot otherwise

be seen such as a cancerous tumor dividing or the immune system at work.

They can show, in detail, what is actually happening. During the

simulation the student can stop and rewind at anytime to get another look.

He/she can also point and click on anything pictured on the screen to get

a definition or explanation of what is going on. There is always

the option of seeking out a professor or textbook if anything remains unclear.

When these computer programs were unavailable, there was really no way

for vet students or even vets to observe these micro systems.

This idexx machine tests the levels of

twenty one substances in the blood such as glucose, potassium, calcium,

and other elements. It also checks the number of platelets, white

blood cells and red blood cells to give the doctor a better idea of what

is going on inside the patient. All the doctor has to do is put a

drop of blood into the Idexx and it does the rest. It even prints

out a receipt looking report that contains not only the animals blood levels,

but includes a column of what a normal reading is for each part that is

off. This report is species-specific. If it is normal it simply

reads normal next to that element. Traditionally the doctor would

have to put the blood under a microscope to determine the cell count.

Finding the level of a certain element would require a lot more blood and

materials resembling a chemistry kit. Not to mention a lot more time.

The IV pump machine regulates the flow

of the intravenous fluids into the bloodstream of the animal. Some of them

come equipped with ways to monitor the animal’s heart rate. It also alerts

the vet. with a beep or ring when something is not right with the animal.

This could be the animal’s heart rate or it could signify that the fluid

is not getting into the animal correctly.

After school is completed and actual practice

is taking place, the place in which the practice is occurring must meet

the needs of veterinary medicine. Many of them have to do with information

technology. Overlooking the obvious would be easy, mostly because

these information technologies are highly taken for granted. A thermostat

to keep a constant temperature throughout the facility is extremely important

chilling or overheating a sick or wounded animal stresses it and can be

devastating. Keeping the doctors and clients comfortable is important

as well. A phone, preferably one with more than one line, is important

for many reasons. One reason being for clients to call up, make appointments,

discuss the situation of their animal and also for them to be able to check

up on hospitalized animals. Another reason is for the doctors to

be able to call out. They may need to call out to gain the permission

of their clients on courses of treatments, to notify them of the condition

of their animals and even to tell them that ’scruffy’ is ready to go home.

Doctors also need, occasionally, to confer with other doctors or pharmacists.

The fax machine is another bit of information

technology that facilitates running a vet practice. In the case of

the Animal Emergency Clinic of CNY, the fax machine is the primary source

of contact with the share holding facilities when it comes to common patients.

The medical charts of an animals are faxed to their regular veterinary

facility to ensure proper follow-up care. It is also used to send

out memos about available shifts and periods of no coverage. This

keeps vets from referring their clients to the AEC of CNY when no doctor

is on duty. The fax is also used to order supplies and medicines.

Without a fax machine most of this information would have to be mailed,

lengthening the time of notification in all of the above situations.

Keeping track of patients, clients and

the services they received is a task that was once tedious, but now, thanks

to technology, is easy, reliable and quick. In the case of the AEC

of CNY, AVImark is the software employed that gets the job done.

This software is a system of veterinary information management that is

capable of handling a wide range of information both on the client and

the patient. It makes appointments and follow-ups. It stores

a file for each patient, which links it to its owner, the client.

This file holds information such as the name, address, home and work phone

number and even chart number of the client. For the patient it holds

the same as well as, the species, breed, weight, color, regular vet, and

even the date of the last entry as well as all services received during

the current and past visits. AVImark has a catalog of all of the

possible services a patient may receive along with the price of that service.

These services are categorized for easy findings under maintenance, treatments,

and applications. And then are further broken down into sub groups

such as laboratory, radiology, injections, pharmacy, etc. Another

time saving feature AVImark has to offer is estimates. These estimates

save time because they contain the routine treatments and medications for

cases that are seen frequently such as hit by car, urinary track infection,

the Parvo. virus, and many other common situations animals are in upon

entering the AEC of CNY. When an estimate is clicked on the expected

treatments are brought up along with the charges for each. The estimate

also includes a variance column so the vet can customize the estimate for

the severity of the patient’s condition. An example of this is the

standard hit by a car dog would need to be hospitalized over night receive

a certain number of injections and IV bags. A dog may come in that

was hit by a car, but is not in as bad shape as would be expected.

The doctor would then reduce the number of injections, IV bags and hours

of hospitalization predicted for the dog. The price on the estimate

would change accordingly to give a more accurate expectation to the client.

After the estimate is complete it is printed to and brought out the client

for review. This saves the doctor time by eliminating having

to write this all out and look up the prices. Before software like

this was made available for use by veterinarians all of this had to be

done by hand and recorded on paper. Storing the files of all of the

patients who received care in a facility took up a lot of room and time

to organize.

Technology has changed greatly what a vet

has to do. The above information technologies play an important role

in the practice of veterinary medicine. Over the years, however,

technology has changed. What has been available to veterinarians

has changed as a result. Thus technology has allowed veterinary facilities

to accommodate more patients at once and accept more animals as patients

in their practice. This is because the time it takes to treat an

animal is shortened thanks to technology.

Section IV:

It is hard to single out the most important

aspects of the role of information technology in the practice of veterinary

medicine. Primarily because know one knows where veterinary medicine

would be to today if any or all of the technology that is a part of it

had not been applied to this science. Any information technology

that increases the chance of a veterinarian being able to save the life

of an animal would be considered important in this field. The list

of these would be never ending. The ones that facilitate vets. the

most are the ones that increase the speed and accuracy of the vets. procedure.

Examples of these information technologies are the idexx machine and the

IV pump.

Technology of veterinary medicine has already

had an influence on human medicine. An example of this are the use

of vaccinations which are now used both on humans and animals. Vaccinations

were originally developed for animals, but were found to be effective in

humans. The use of live-virus vaccines has been used on humans since

WWII. (www.encyclopedia.com) The use of certain information technologies

in the field of human medicine are sure to have an influence in the practice

of veterinary medicine. Antibiotics are another example of veterinary

technology influencing human medicine. It is expected that

advances in human medicine will affect veterinary medicine. The use

of information technology to enable surgeons to perform surgery off site

is sure to carry over to veterinary medicine. This will have a great

affect on the way doctors perform in this field.

To prepare oneself for success in veterinary

medicine all of the required graduate and undergraduate courses must be

completed. However, the best preparation for success is exposure

to the field. In order to be completely ready for the practice of

veterinary medicine knowing how to use the relevant information technologies

is a necessity. The best way to accomplish this is through additional

courses or observation. According to Tamela, a licensed veterinary

technician who works at the AEC of CNY, watching another vet. at work,

and seeing how he/she uses the technology to his/her advantage is an invaluable

way to prepare for success in this field.”