TERM PROJECT

ON

Title: **Digital Healthcare for Pets**

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Semester-1

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Abstract

In the evolution of healthcare systems, technology has always played a critical role. Veterinarians have been combining their knowledge with technology to produce creative solutions to pet problems since the inception and acknowledgement of pet health as a science. This term project gives a brief idea about how technology is changing the life of pets and veterinarians and also helping to fill the conversation gap between the pets and pet owners.

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Figure 1

The Future Of Veterinary Care Is Digital Health For Pets, every minute of every day, technology exceeds people's expectations. It didn't take long for veterinarians and pet owners to acknowledge the benefits of technology when creative brains were at work. Pet adoption has increased dramatically in big cities and even rural places around the world in the last year. Many individuals consider their pets to be children or loyal companions, and they are also a big global enterprise. The pet market has expanded, with sales of pet foods, toys, pharmaceuticals, and wearables increasing dramatically. According to Mordor Intelligence, the worldwide pet service market

was valued at USD 20,727.0 million in 2020, and it is expected to grow at a compound annual growth(CAGR) of 5.4 percent to USD 28,561.9 million by 2026.

2 Digital technologies for pet care

As the healthcare business transitions into the digital age, it's only natural that the pet health industry would follow suit. Due to sophisticated health monitoring platforms and wearable gadgets, pet owners may now follow virtually every aspect of their pet's health. The hidden becomes apparent with smart pet technology, allowing us to provide better care for our pets. By leveraging technology to learn about dogs, we can notice health changes, track their health over time, and see the effects of diet, which can help us better understand the relationship between nutrition and health.

2.1 Remote Monitoring

2.1.1 Link

Link is a smart pet wearable that allows you to track your pet's location and activity in real time. Smart Tracking Technologies, a technology firm based in Jacksonville, FL, created it. Link connects to a smartphone through

Bluetooth LE, allowing owners and pet care facilities to identify and track a pet's location and movement using a smartphone app. When the pet is sleeping, Link goes into a battery-saving 'sleep' mode and wakes up when the animal moves. The main CPU is triggered to activate the monitoring device by a motion detection wakeup feature.

2.1.2 Vet Gaurdian

VetGuardian is the first and only zero-touch remote telemonitor designed specifically for veterinarians. The device continuously collects vitals from animal patients such as pulse, temperature, and respiration rate from up to five feet away without the use of wires or direct contact, reducing stress for both animals and vets. VetGuardian is an excellent tool for monitoring post-surgical, overnight, and ICU animal patients.VetGuardian is an excellent tool for monitoring post-surgical, overnight, and ICU animal patients. Even when they're not in the clinic, veterinarians have an extra set of eyes on their patients with VetGuardian.

Figure 2

2.2 Weareables

2.2.1 Whistle

Whistle is a GPS enabled pet tracker that clips into your dog's existing collar. The device tracks your pet's whereabouts using ATandT's cellular connectivity, as well as GPS and GLONASS signals. Whistle is more than simply a pet GPS tracker; it also keeps track of activity.It examines calories burned as well as time spent resting or being active.

Figure 3

2.2.2 Petkit

Petkit has a lot of features that make it a good choice. Not only will it track your dog's activities, but it will also provide health analyses, consumption, health alerts, and mood information. The health analysis is ideal for senior pets and can be shown to your veterinarian during visits.

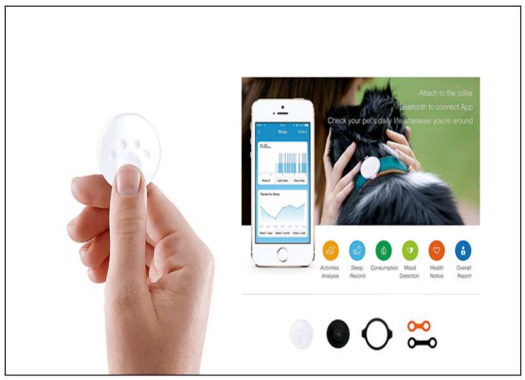

Figure 4

3 3-D printing Boosting Pet prosthetics

Figure 5

In the future, 3D printing offers tremendous promise for assisting pets.The capacity to create a completely bespoke prosthetic at a low cost is critical, and as technology advances and expands into other materials, more dogs (and their owners) will be able to benefit. Some of the fantastic applications are: Veterinarians in Brazil recently utilised a 3D printer to create a new shell for Fred, a tortoise whose old shell was severely destroyed in a forest fire. Beauty the bald eagle was shot in Alaska, and the conservation group Birds of Prey Northwest enlisted the expertise of a mechanical engineer to 3D print a new beak for her. Biologists have also used the technology to print bat models to learn about their flight behaviour without having to experiment on the creatures themselves.

4 Technology Advancing Veterinary Medicine

The science of veterinary medicine has advanced by leaps and bounds, allowing veterinarians to make speedier di-

agnoses, more precise prognoses, and, ultimately, save animal lives. Some of the examples are:

4.1 Microchipping

For a modest cost, many vets and animal shelters now microchip animals. Families that finish this procedure and register their pet with a microchip firm are provided with a dependable form of pet identification in the event that the animal wanders away. The microchips, which are approximately the size of a grain of rice and are normally implanted just beneath the skin between the animal's shoulder blades, contain a registration number and the phone number for the registry for that specific brand of chip.

4.2 Ultrasounds

Ultrasound technology may be used on an awake animal (Advantage over MRI), saving a lot of money on anaesthetic. Cardiovascular doctors are now using the same technology that is often used on humans to create photos of foetuses as they develop to create 3D and even 4D images of hearts.

4.3 Recombinant DNA

The discovery of recombinant DNA, or rDNA, has set the stage for a medical revolution, including and particularly in veterinary medicine.We can not only make medications cheaper to make with rDNA, but it also opens the door to gene therapy.Veterinarians can use rDNA methods to restore missing or damaged genes in animals and treat a variety of medical problems.

5 Alternatives to Animal testing

The invention and execution of test procedures that do not require the use of live animals are alternatives to animal testing.Fortunately, the development of non-animal technologies isaccelerating. Some of the examples:

5.1 Mitra® Microsampling and VAMS™ Technology

Preclinical researchers can employ Mitra microsampling technology to reduce the volume of blood collected from laboratory animals like rats and mice, reducing the number of animals used in studies.

5.2 Microchip organs

These microchip organs could potentially replace animal experiments by providing a more ethical disease model that can provide a deeper level of insight into a medication candidate's efficacy and toxicities. Some of the examples are:

5.2.1 Lung-on-a chip

By simulating the complex mechanical and biochemical properties of a human lung, the lung-on-a-chip provides a new in vitro approach to drug screening. It's a little memory-stick-sized gadget made of a clear, flexible polymer with hollow channels produced uses computer microchip manufacturing techniques.

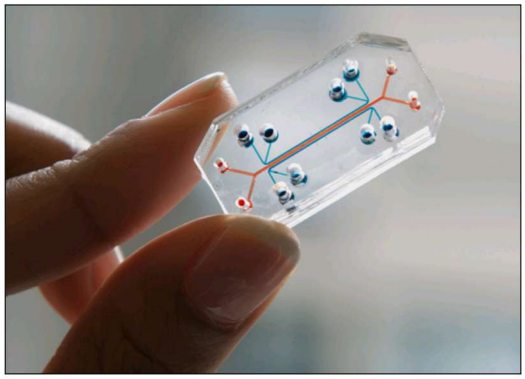

Figure 6

5.2.2 Human-on-a-chip(Ichip)

Lawrence Livermore National Laboratory scientists and engineers are working on a "person-on-a-chip," a microscopic external recreation of the hu-

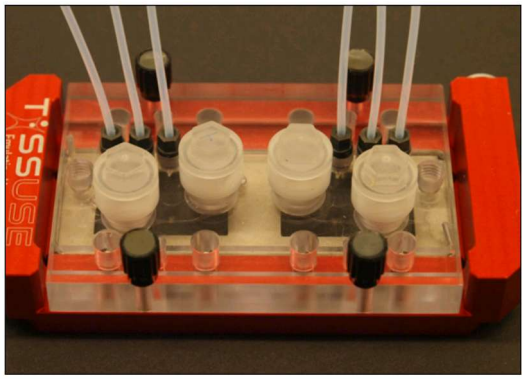

Figure 7

man body that combines biology and engineering.). The iCHIP (in-vitro Chip-based Human Investigational Platform) initiative replicates four important biological systems: the central nervous system (brain), peripheral nervous system (nervous system), blood-brain barrier (brain barrier), and heart.

6 References

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