# Review of IOT in Pet Management

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***Abstract:****With The Advent Of New Technologies And Enhancement In The Ones Already Existing, Particularly In The IT Industry, The Mankind Has Received So Many Technologies At Their Disposal Such That They Can Reduce Their Physical Efforts And Adopt To More Automatic Friendly Methods In Order To Get Their Jobs Done. One Such Technology That Is Rapidly Developing Is The IOT, I.E., Internet Of Things.Iot Is Basically A Cluster Of Networking Devices Interconnected With Each Other And Are Embedded With Sensors And Connectivity Chips That Enable Exchange Of Data Between Devices And Thus Making It Responsive. The Concept Of Iot Can Well Be Paired To Pets And Managing Their Various Activities. In This Paper, We See How We Can Manage Pets Without Much Human Intervention Using The Concept Of Iot.*
***Keywords:*** *Internet Of Things, Pet Management, Automation,Connectivity*

## I.     Introduction

In The Era Where Technology Is Developing So Rapidly, Humans Today Are Exposed To A Variety Of Technologies Which They Could Have Only Imagined To Have Been Existed Few Years Back. New Technologies Are Being Introduced In Various Fields, Be It Medicine, Engineering Or Even Banking And Finance And Many More. The Main Aim Of Introducing The Technologies In Various Fields Is To Reduce Human Efforts And Maximize Automation Of Work So As To Get Better Productivity With Minimum Usage Of Any Resource. Saying So, With Technologies Playing A Pivotal Role In Lives Of Humans, The Way Humans Have Been Living Has Also Undergone A Drastic Change By Adapting The Various Technologies They Are Getting At Their Disposal.

One Such Interesting Technology That Has Seen Its Emergence Is The Use Of Internet Of Things (Iot) For Managing Pets. Humans These Days Have Become To Busy With Their Lives That Sometimes It Becomes Difficult For Them To Spend Some Quality Time With Their Pets. This Negligence Often Affects Their Pets Negatively. To Avoid Such Things To Happen, Technologies Are Being Conceptualized Keeping In Mind About The Various Aspects Of Pets' Behaviorand Their Needs. As A Result, Technologies Are Developing To Aid Humans To Manage Their Pets While They Are Not Around Them Physically. Thus Pets Are Made To Feel More Lively With Such Technologies And Also It Allows Humans To Have Some Kind Of Relief For Their Pets While They Are Not Around.

## II.     Literature Survey

Internet Of Things ( Iot ) Is One Of The Most Rapidly Developing Technologies That Has Seen Its Emergence In The Past Few Years. As Of 2016, The Vision Of The Internet Of Things Has Evolved Due To A Convergence Of Multiple Technologies, Including Ubiquitous Wireless Communication, Real-Time Analytics, Machine Learning, Commodity Sensors, And Embedded Systems[2]. In Simple Words, Iot Has Been Developed By Combining Various Electronic Devices Together Which Are Inter-Connectable And Able To Transmit Data, I.E., Efficient Transmission Of Data Should Happen Without Much Human Intervention.

The "Things" In The Iot Not Only Can Be Referred As "Connected Together", But Also Can Be Realized As The Functions Of Recognition, Localization, Tracing, Management And So On. Iot Requires All Things To Be Identified[1]. This Definitely Is True In The Case Of Pet Management Via Iot. Though Pet Owners May Not Be Present Physically With Their Pets But At Least The Pets Would Be Able To Feel Their Presence,  Even Though It Is Virtual In Nature.

Seeing Such Scope, The Economic Impact And Benefits Of The Iot Will Be Huge In Future. Gartner Predicts That The Aggregated Value And Economic Benefit Of The Iot Will Exceed $1.9 Trillion In The Year 2020 Alone[3]. The Analysts At Mckinsey & Company Have Looked At The Iotand Have Identified 6 Major Benefits (At Least) That The Iot Will Bring:

- Tracking Behavior For Real-Time Marketing;
- Enhanced Situational Awareness;
- Sensor-Driven Decision Analytics;
- Process Optimization;

- Optimized Resource Consumption; And
- Instantaneous Control And Response In Complex Autonomous Systems.

## III.     Pet Management Through Iot

In Today's World, Keeping A Household Pet Have Become One Of The Most Common Thing , But Buying One As A Gift And Taking Its Care Are Two Different Things. The Pet Is Just Like A Human Baby Which Needs Constant Attention And Care. It Needs Feeding, Bathing, Monitoring, And Lots Of Love.

The Most Recent Pet Ownership Study By The American Pet Products Association (APPA) Noted That 85 Million Families (68 Percent Of All U.S. Households) Own A Pet, And More And More Of These Families Are Viewing Their Pets As Family Members. In Fact, A 2016 Survey Found 95 Percent Of Pet Owners See Their Pets As Part Of Their Family, Up 7 Points From 2007[6].

Luckily Today, With The Help Of IOT We Can Provide Some Of These Things Using Machines And Help You Save Your Otherwise Precious Time. Many Of These Things Are Repetitive And Usually Done On Fixed Schedules. We Can Use Smart Machines That Can Adapt Using The External Stimuli Like Temperature, Animal Behaviour And Many Other Factors.

### 1.   Food

One Of The Most Important Task Of A Pet Owner Is To Provide Timely Food To Their Pet. There Can Be Cases When The Owner Fails To Accomplish This Task, Due To Several Reasons Like Busy Schedule, Uninvited Guests, Or He Might Not Be Physically Present There To Provide Food. Under Such Conditions Our Smart Machine Can Recognize The Failure Of The Owner To Accomplish The Task And Based On The Situation It Can Either Remind The Owner To Accomplish The Same Or Automatically Fill The Feeder.

It Can Happen That The Pet Food Stored In The House Has Been Exhausted And The Owner Has Forgotten To Get More Food. In Such Cases Our Smart Machine Will Inform The Owner To Get The Pet Food. It Will Take A Step Further By Reminding The Owner About The Same, The Next Time He Visits The Super Mart.



**Figure 1:** Automated Pet Feeder

### 2.   Location

It Might Happen That The Pet Escapes The Perimeter Of The House While The Owner Was Busy With Something Else. In Such Cases Our Pet Monitoring Functionality Will Come Into Action. It Is Equipped With A GPS Device That Can Track The Location Of The Pet And Send It To The Owner On His Smart Device Such As Smart Phone, Tabs Or Their Laptops Etc. This Way Even The Most Notorious Pets Can Be Found Easily And Brought Back Home.

**Figure 2:** GPS Tracking Device

### 3. Automated Calling

This Feature Is Used When The Owners Are Away From Their Homes, At Work Or Some Other Place. In This Our Cameras Will Keep A Constant Track Of The Pet And Record Its Behaviour Patterns. In Case Some Abnormal Behaviour Or Threat Is Found, The Monitoring System Will Immediately Inform The Pet Owner Who Can Then Have Direct Visuals Through The Internet On His Smart Device.

This Feature Can Also Be Used When The Owners Want To Keep An Eye On Their Ill Pets And Want To Comfort Them Through Video Calling, As Both Sided Visuals Can Be Provided.



**Figure 3:** Automated Calling Device

### 4. Automated Tanks

Aquatic Animals Kept In Tanks Require Very Specific Temperatures, Salinity Levels, Oxygen Levels, And Controlled Exposure To Sunlight. Thus We Can Manage The Temperature Of The Tanks By Using Appropriate Sensors And Heaters That Work Automatically As And When Required.

Oxygen Monitoring And Maintaining Can Be Taken Care By Our Machines, That Constantly Track The Oxygen Levels. Salinity Levels And Sunlight(U. V. Rays) Can Be Controlled Automatically Once The Requirements Have Been Taken From The Owner. This Reduces The Work Of The Owner By A Great Fraction And Also Reduces The Scope Of Human Error.

**Figure 4:** Automated Fish Tank Device

**5. Entertainment**

There A Lot Of Instances When The Pets Become Bored, As Their Owners Are Not Present There And They Have Nothing To Do. This Frequently Occurs With Very Playful Pets Like Dogs And Cats. In Such Cases Our Systems Automatically Engages Them With Playful Activities And Games, To Keep Their Minds Distracted And Keep Them Entertained. Our Systems Detect Their Behaviour And Make An Estimate About Their Moods And Act Accordingly.


**Figure 5:** Entertainment Device For Pets

## IV. Future Scope

As Humans Are Getting More Accustomed To Newer Technologies Day By Day, The Introduction Of Technologies For Managing Pets Can Also Have A Good Scope. With Newer Technologies Which May Pretty Much Be Integrated With The Existing Smart Home Technologies Or Even Their Very Own Mobile Phones, Humans May Find It A Lot More Easier To Manage Their Pets From Anywhere They Want. The Visions For Such Development Have Already Been Seeded And We Just Need To Give A Shape To The Vision That Has Been Proposed. The Envisioned Technologies May Have Variety Of New Operational Methods But The Basis Would Be Iot. Thus With Iot We Can Address The Issue Of Remote Monitoring, Feeding, Analyse Health And The Ensure Their Well Being In Future[5].

## V. Conclusion

With The Fast Paced Lives Of Humans These Days It Becomes Crucial To Come Up With Some Innovative Technologies That Benefit The Pets When The Owners Are Not Around Them. Though Initiatives Have Been Started To Adopt To Such Technologies, But Still Pet Management Via Iot Has Not Seen A Wide Spread Usage Yet. It Becomes Imperative To Encourage Pet Owners To Adopt To These Developing Technologies And Introduce It To Their Pets So That They Do Not Have To Worry Much When Their Pets Are

Left Alone At Home To Manage At Their Own And Also Check Upon Them For Their Well Being And Happiness.

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