Review of Smart Farming using AWS in IoT

Madan Mohan Mishra[1] Akhilesh A. Waoo[2]
[1]Research Scholar [2]Principal
[1,2]Department of Computer Science Engineering
[1,2]AKS University, SATNA, MP, India

Abstract— IOT is an emerging field for automatic system and huge applications are running in health care, transportation, energy, automobiles and much more areas in presently running with this same. According to this study each state is so much useful for smoothness of current data and time schedule is the boundary of running application bases on sensors readings. It is the quite quick behavior of the internet of things, sensors are actuated and run fastest manner, industrial operation, save power consumption and enormous scale in Agriculture for smart farming, smart irrigation in respect of different types of soil and moisture content as per metrological dept during the run time environment for different crop logs on running the Cloud services. Each cycle has run with proper paused and operate with auto sequence. Incarnation of smart things has working with virtue of sensors. It is a recent trend technology where all things are running in automated way with its updated log such as health care, smart farming, and emergency in terms of covid19. As on scenario real –time sensors are required for decision making support in the sequence of ground level work. IoT works like sixth sense technology, humans beings are understand using sensing organs by taste, feel, see visible objects, listen the voice, smell different type fragrances and another instructions are read by sensors. Smart home systems are also vast applying in study handle the power consumption in electronic gadgets. Each things logs maintained by the cloud.[1].

Keywords: AWS, Corporate Social Responsibility, Sixth Sense, Smart Home, IoT, Energy, Transportation, Fragrances, Welfare, Smart Farming, Metrological, Consumption.

I. Need and Significance of the Research

Research is the way to introduce new things to society and present the standared information as a way of professionals.

this is the specified way to appears the knowledge of discovery in specified area and researcher has present the expressed knowledge source in front of society through the registered journals and conferences.

Paper writing is the practice of speaking your views in the form of new things even a researcher has produce new results through past papers which is known as secondary research. Sometimes we can present new things with major operational thoughts like AWS, IOT with different types of sensors.

II. Objective

The main objective of this paper to discuss a broad overview of Internet of Things on Automatic weather station and discussed with emerging technologies and their required healthy machinery to produce huge yield using smart system in smart farming and this system would be helpful in crop production for farmers and enhance the cultivation in rural areas where farmers has not sound in recent trend technologies.

Farmer has watched the review about the climate, soil moisture and required humidity for plant through the support hypertext and Automatic weather station data has already accessed to start and stop motor control through the micro controller.

III. Hypothesis

A. Environment Sympathy and Humanity:

Ecological sympathy and humanity is needed for better future and sustainability of life, huge challenges are raised for bio diversity and time line based ecological incarnations are needed to solve the problem and fill the gap for man and nature [1].

B. Working Staff Problem:

Real environment in all things are running with the support of human beings. we are fully based on working persons in different areas and we dose not fire on not achieving the target because bases on humanity we are doing in simple and adjusted way, things are running in proper manner but using the machinery, machines are fully hard working and doing work in decision making sequences or we can say run under decision making algorithms available in user interface applications based operators and they are costly members for because we are fully responsible for staff health, leave, welfare up to availability of the organizations staff or industry. Everyone is not rich to afford industrial corporate social responsibility bases on humanity for long purpose only [2].

C. Higher Cost of Material Cost:

Maximum things are available in costly even transportation are also inhibit to not allow pilot projects and run-in different areas smart application which is decision making application.

Living organismshas would be accessed by Infrared sensor, iris sensor even many more to fold out in sensing technologies. And probe even smart farming is alsoconducting to produce huge yield through will be possible on recent trends. Traditionally farmers are the back bone of the country & real time applications would be helpful for the growth of farmers & food even we can save the water during irrigation when decisive system worked as proper manner.

All things are well then country economy would be enhanced as smooth way. Multiple grains productions are fully based on proper irrigation & smart irrigation would be worked as smart agent, those kinds of activities are run under the sensors supervision [8].Example of health sector where patients are suffering from hyperlactamia and cardiac diseases ,Intensive care units announces shock index rates of mortality ratio of cardiac patents, At that time smart triage wearable sensors are required for the reading of physiological

data under the assigned dead line sequence order. Decision control system are required in multiple sectors like transport are the life line for anywhere during the Transport, major surgeries, cardiac arrest and so many cases in how to fast reach in hospital is the major responsibility of the patient Relatives or care takers but it can be possible when transport sensors would be fresh data crowd & noise free route for specific time that would be feasible for revenue growth of the industry [6].

Another example save water in bathroom during the face wash water would be used with maximum requirement minimum input, such as 250 ml water would be required we can use and clear face but water pipe has releases the water through spout in slow frequency & during the urinate water will flow in the pot even during potty huge water is used so can manage the flow of water through the sensors (optical sensor) usage, just connect & water would be flow but specific according to the log. Paused (delay) is also required for specific time otherwise multiple time iris sensors can accept and releases the flow of water so we can follow the delay (paused) which has stopped for some time then again start through the iris sensors connect and similar thing would be applicable in smart farming where soil & moisture sensor has sensed

The instruction to micro controller for start the sprinkler on the feasible manner, all things are done under the supervision of microcontrollers. These sensors are working like web form events like (onclick, onsubmit, onblur, onmouseout, onmouseover, onload etc different types of events are run in the web form. When hypertext object has accepted any type of input & similar thing run in IoT platform [16]. Sensors would be accept input and output come in the order of connected application with the flow of signal and perform the operation in application when flow of control has started. All such things are working together by using the operators such as control statements.

All such things are working as by the control statement conditions and such things are working with the sequence of control statements such as conditional statements, loop statements, jumping and branching statements.

IV. PROPOSED METHODOLOGY

- Use AWS (Automatic weather station) to track the data in every 5 seconds as constant manner.
- Moisture and soil sensors has used for specific value-based operations.
- Accessing data in Arduino microcontroller from Automatic weather station through http protocols.
- Reduce the time gape for overall process flow with multiple serial communication in different things.

A. Communication Cycle Overview

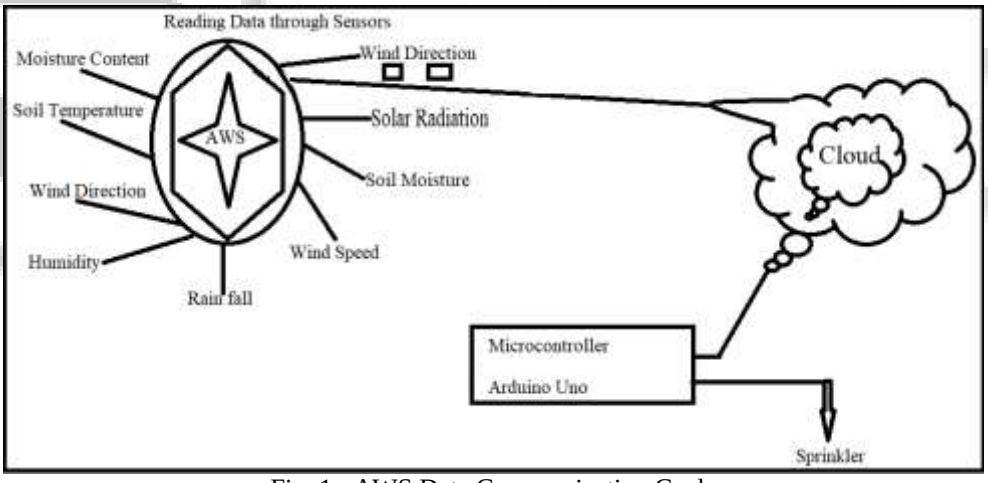

Fig. 1: AWS Data Communication Cycle

An automatic weather station has specially developed for metrological data and run under the Deep Learning (DL). AWS has connected with cloud and store all things like soil moisture, wind direction, wind speed, Solar radiation, rain fall, soil temperature using multiple sensors and sends the each 5 seconds data to cloud and these such kind of data would be delver to ESP8266,Arduino UNO like microcontrollers. These kinds of values are accessed then send data through serial communication to water application [12].data table is attached here with to examine all such things. This Data has accessed and available in this study [13].

Date	TEMPERATURE	HUMIDITY	WIND SPEED	WIND DIRECTION	SOLAR RADIATION	BAROMETRIC PRESSURE	SOIL TEMPERATURE	SOIL MOISTURE	SOIL CONDUCTIVITY	RAIN FALL	DEW POINT	LEAF WETNESS
23-01-2022 14:20	022.1 *C	045.9 %	00.2 m/sec	311 Degree	0181 W/m2	099 kpa	023 *C	020 %	00.523 mS/cm	000.50 mm	009 *C	006 %
23-01-2022 14:15	022.0 *C	044.6 %	00.2 m/sec	329 Degree	0143 W/m2	099 kpa	024 *C	020 %	00.524 mS/cm	000.50 mm	009 *C	006 %
23-01-2022 14:10	022.1 *C	044.9 %	00.2 m/sec	329 Degree	0139 W/m2	099 kpa	024 *C	020 %	00.524 mS/cm	000.50 mm	009 *C	006 %
23-01-2022 14:05	022.2 *C	044.2 %	01.1 m/sec	329 Degree	0163 W/m2	099 kpa	024 *C	020 %	00.525 mS/cm	000.50 mm	009 *C	006 %
23-01-2022 14:00	022.2 *C	043.8 %	00.0 m/sec	329 Degree	0152 W/m2	099 kpa	024 *C	020 %	00.526 mS/cm	000.50 mm	009 *C	006 %
23-01-2022 13:55	022.5 *C	043.2 %	00.5 m/sec	053 Degree	0168 W/m2	099 kpa	025 *C	020 %	00.528 mS/cm	000.50 mm	009 *C	006 %
23-01-2022 13:50	022.8 *C	043.8 %	00.2 m/sec	339 Degree	0199 W/m2	099 kpa	025 *C	020 %	00.528 mS/cm	000.50 mm	009 *C	006 %
23-01-2022 13:45	023.5 *C	040.5 %	01.1 m/sec	341 Degree	0159 W/m2	099 kpa	026 *C	021 %	00.529 mS/cm	000.50 mm	009 *C	006 %
23-01-2022 13:40	023.8 *C	037.6 %	01.3 m/sec	215 Degree	0610 W/m2	099 kpa	026 *C	021 %	00.530 mS/cm	000.50 mm	008 *C	006 %

Fig. 2: Automatic Weather Station Data logs

Few heads are discussed herewith to applicable in Smart Agriculture, where all temperature, humidity, wind speed, wind direction, solar radiation, soil temperature, soil moisture, soil conductivity and rail fall all such things are applicable on smart farming, where sprinkler has start and stop in agriculture land bases on crop requirement, such as: potato crop cultivation are fully bases on soil moisture, realative humidity and micro climate humidity for sandy, sandy loam and loam soil. Discussed different types of soil has accepted as the water on bases of soil conductivity as specific time which is fully bases on temperature and available rain fall availability.[2] such things has accepted in kufri sindhuri, kufri Chandra mukhi,kufri jyoti, Kufri Lauvkar, Kufri Badshah, Kufri Bahar, Kufri Lalima, Kufri Jawahar, Kufri Sutlej, Kufri Ashoka, Kufri Pukhraj, Kufri Chipsona-1 and Kufri Chipsona-2 [14]. These such kind of crop production has discussed with mathematical equation where Let me know var A=Sandy soil ,var B=Sandy Loam soil var C=Loam soil,soil conductivity=D and different Potato species=E and soil moisture=F has present in set equation $(E \cup D) \cap (F \cup A) \cup (B \cup F) \cap (C \cap D)$ as bases on education vew to expand the formulation structure to view with this order and develop the application where sorted types of species has address with the climate based cultivation for potato and take huge yield as recorded 1088 quintals per hectare and the harvested by the high-density method of farming and organic fertilizers has used in the land and done wonders with KUFRI PUKHRAJ potato crop[15].As such the farmers has done the wonders with organic farming and high density as such the crop has harvest a new record using smart farming[3].The decision making things are running in a big era to construct in major role to develop the new things using the smart things and do new with every moments using the smart logics, smart way or adopt new technologies[2].The development available in major area with different types of applications in smart farming ,home automation even sixth sense in also to use in IoT as major role play as do some things running with you but we can't seen on the current time as the applicable theory has fully opaque object has not visible but exist in the current state as there is objects are there but with huge distance in not got like web page objects[17]. As many things are running in front of you to design and developed by smart things such kind of sensors has doing work but we does not see the work with real environment because signals has processed in IoT and we can see the changes of objects in different motion to watch as such like multiple Arduino boards has connected with proper serial communication and receives the instruction through current environment and do much more in real things [3].Decision making things has do jobs in multiple areas and do job as node to node channel relay with proper modulation and camera has receives the images and compare [3].

V. Expected Outcome

All such things are truly proved as above written literature the IoT application are working fast as given by the input so we can say this is a decisive control system is the fastest manner run in the order of real time clock as much in serial communication order. all things are basically applicable in real life applications and useful in smart farming to take the huge cultivations with organic farming, in order to available quality we can take huge cultivation and present the excellent definition in the market, where technology has dosomething in smart way and everywhere we can apply the smart things in enormous scale and product-oriented technologies also present the smart farming where organic cultivation would produce a standard outputs.

Bibliography

[1] Keping Ma, Fuwen Wei, "Ecological civilization: a revived perspective on the relationship between

humanity and nature, National Science Review", Volume 8, Issue 7, July 2021, nwab112, https://doi.org/10.1093/nsr/nwab112.

[2] Kang, K.-D. "A Review of Efficient Real-Time Decision Making in the Internet of Things. Technologies 2022", 10, 12. https://doi.org/10.3390/technologies10010012.

[3] Abhishek Raghuvanshi, Umesh Kumar Singh, Guna Sekha Sajja, Harikumar Pallathadka, Evans Asenso, Mustafa Kamal, Abha Singh, Khongdet Phasinam, "Intrusion Detection Using Machine Learning for Risk Mitigation in IoT-Enabled Smart Irrigation in Smart Farming", Journal of Food Quality, vol. 2022, Article ID 3955514, 8 pages, 2022, https://doi.org/10.1155/2022/3955514.

[4] Neha K.Nawandar,Vishal R.Satpute,"IoT based low cost and intelligent module for smart irrigation system", https://doi.org/10.1016/j.compag.2019.05.027.

[5] N. G. S. Campos, A. R. Rocha, R. Gondim, T. L. Coelho da Silva, and D. G. Gomes, "Smart & Green: An Internet-of-Things Framework for Smart Irrigation," Sensors, vol. 20, no. 1, p. 190, Dec. 2019, doi: 10.3390/s20010190.

[6] "NRIX 2021 Global Traffic Scorecard", https://inrix.com/scorecard/.

[7] Kim SY, Hong KJ, Shin SD, Ro YS, Ahn KO, Kim YJ, Lee EJ. Validation of the Shock Index, Modified Shock Index, and Age Shock Index for Predicting Mortality of Geriatric Trauma Patients in Emergency Departments. J Korean Med Sci. 2016 Dec;31(12):2026-2032. https://doi.org/10.3346/jkms.2016.31.12.2026..

[8] B. Ji et al., "Survey on the Internet of Vehicles: Network Architectures and Applications," in IEEE Communications Standards Magazine, vol. 4, no. 1, pp. 34-41, March 2020, doi:10.1109/MCOMSTD.001.1900053.

[9] S. Hu et al., "Data Acquisition for Real-Time Decision-Making under Freshness Constraints," 2015 IEEE Real-Time Systems Symposium, 2015, pp. 185-194, doi: 10.1109/RTSS.2015.25.

[10] Ioannou K, Karampatzakis D, Amanatidis P, Aggelopoulos V, Karmiris I. Low-Cost Automatic Weather Stations in the Internet of Things. Information. 2021; 12(4):146. https://doi.org/10.3390/info12040146.

[11] Dean of Agriculture, A K S University, Satna MP. https://www.aksuniversity.ac.in.

[12] "Soils of India: Classification and Characteristics",https://www.clearias.com/soils-of-india-classification-characteristics/.

[13] "Potato Varieties", http://nhb.gov.in/pdf/vegetable/potato/pot013.pdf.

[14] "Nalanda sets world record in potato production", https://timesofindia.indiatimes.com/city/patna/nalanda-sets-world-record-in-potato-production-again/articleshow/18551831.cms.

[15] Sotiris Christodoulou and Theodore Papatheodorou,"WEP: A Reference Model and the Portal of Web Engineering Resources", https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.96.9894&rep=rep1&type=pdf.

[16] Pierre Geneves, Nabil Layaida, Vincent Quint,"on the Analysis of Cascading Style Sheets", https://dl.acm.org/doi/epdf/10.1145/2187836.2187946.

[17] Acharya Institutes Learning Resource Centre, "Sixth Sense Robot For The Collection of Basic Land Survey Data", http://13.232.72.61:8080/jspui/handle/123456789/5268.

[18] Latapí Agudelo, M.A., Jóhannsdóttir, L. & Davídsdóttir, B. A literature review of the history and evolution of corporate social responsibility. Int J Corporate Soc Responsibility 4, 1 (2019). https://doi.org/10.1186/s40991-018-0039-y

