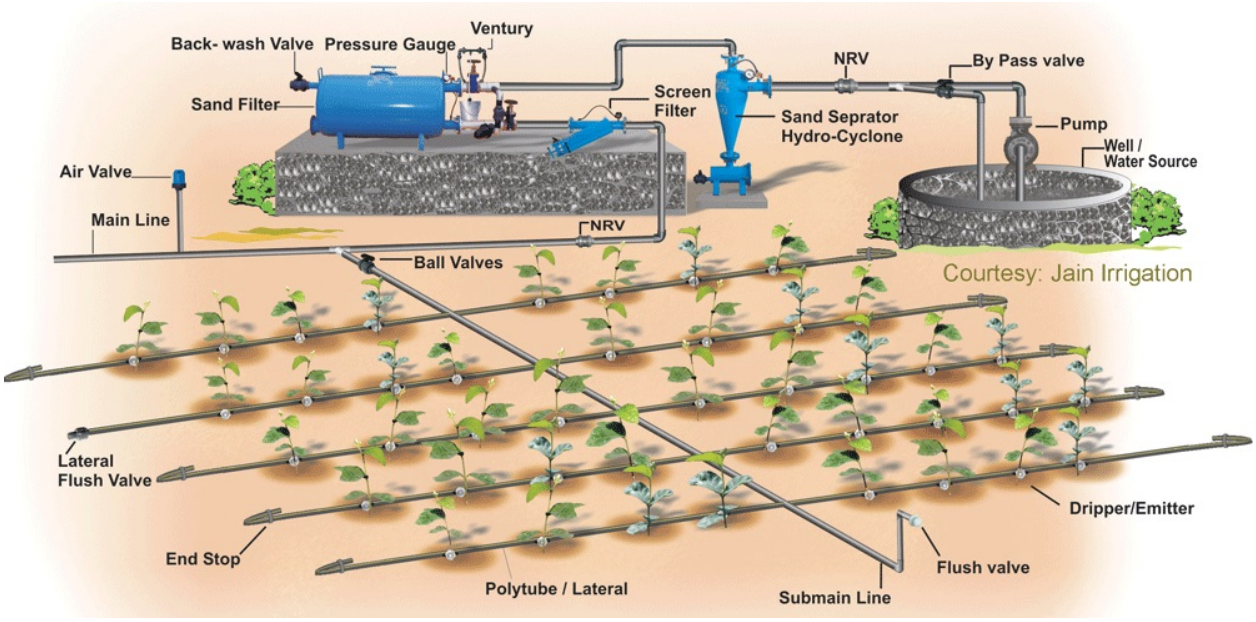
APPLICATION DEVELOPMENT AND SOFTWARE DEVELOPMENT CYCLE



An automated irrigation system refers to the operation of the system with no or just a minimum of manual intervention beside the surveillance. Almost every system (drip, sprinkler, surface) can be automated with help of timers, sensors or computers or mechanical appliances.

As shown above, the irrigation system is composed of certain hardware structures which corresponds to well thought out predetermined software functions. The system consists of irrigation pipes kept a uniform distance from each other which runs across the full farming plot. Embedded in these irrigation pipes are in-built sprinklers which are then opened to release water in a circular path around it via the timed command interval of the software. Incase the command isn't in accordance to the weather, the software also contains a manual on and off switch which can be controlled by the farmers.

The system also contains a temperature sensor which reads the temperature of the soil and crop and if the temperature is above a set standard, an alarm is set off alarming the farmers that the manual on and off switch which control the sprinklers embedded in the pipe need to be turned on.

Among other things, the system contains a moisture sensor which corresponds to the moisture indicator. Once the sensor reads that the moisture content is too much, the timed interval would not activate the sprinklers.

The system is also made up of a tank which stores the water to be used, and an automatic pump which runs once the tank is below half.

HARDWARE FEATURES OF ABUAD FARM IRRIGATION SYSTEM

- Backwash value

- Moisture sensor

temperature sensor

Other hardware features include:

- AIR VALVES: An automatic air valve is designed to release small amounts of air from a pressurized line. As air accumulates in the upper part of the air valve chamber, it causes the float to gravitate downwards. This in turn cases the automatic orifice to open, releasing the accumulated air. Once the air is discharged, the water level and float rise, causing the automatic orifice to close. The valve helps maintain proper water pressure and consistent flow; releases air bubbles and prevents air locking of the system; and ensures that the system's hydrometers are measuring water, not air volume, so that the correct amount of water reaches the crops.

- IRRIGATION PIPES : The pipes are the basic component of all irrigation networks. There are various kinds and types available in many pressure ratings and in different sizes (diameters). The pipes in use for farm-level irrigation systems are mainly in rigid PVC and polyethylene (PE). Quick coupling light steel pipes and layflat hoses are used on a smaller scale. Threaded galvanized steel pipes are of limited use.

- SHUT-OFF VALVES OR STOP VALVES. THEY are most widely used valves, manually operated. Usually installed between the ends of two pipes they serve to start or stop the flow of fluid in the pipeline. Stop valves are primarily designed for just two extreme situations: either to be completely open, to freely pass the full flow of fluid, or to be completely closed, to prevent any flow

- WATER TANK: This is the member which stores the water to be used in the irrigation process

- CHECK VALVES. Check valves, also called non-return valves, permit flow in one direction only and prevent reversal flow in piping by means of an automatic check mechanism. They come in two basic types: the swing check, which can be installed in horizontal or vertical piping; and the lift check, for use in horizontal lines only. Water flow keeps the check valves open, and gravity and reversal of flow close them automatically. They are placed in-line at the head control unit

immediately after the pump. Swing checks are used with gate valves, lift checks with disk valves. Check valves are made of several metal materials and brass, and are screw type (female joints) quoted in inches from to 4 inches, at a PN of 16.0 bars.

- DRAINAGE SYSTEM: This is put in place incase excess water is released into the farm. As the name implies, it drains the excess water.

SOFTWARE FEATURES OF ABUAD FARM IRRIGATION SYSTEM

- The software would contain a kind of timer indicator which automatically sets off the irrigation within a certain time interval.

- It would also contain a moisture indicator which corresponds to the moisture sensor hardware. When the moisture content of the soil is over a predetermined standard the software automatically activates the drainage system.

- It would contain a manual on and off switch incase the interval set is not in accordance to the weather, then the person managing it can take initiative and start the irrigation system beforehand.

- It would also have a manual on and off switch for the drainage system incase as a contingency for inaccurate reading by the moisture indicator

- The software would be created with compatibility of windows:

1) Windows 7 (Professional, Premium, AND Ultimate).
2) Windows 8 and 8.1
3) Windows 10
4) Mac OS

FLOWCHART AND ALGORITHM

Step 1: start
Step2: check moisture and temperature content of the soil w,x,y,z
Step 3: if w> set temperature and moisture
display Set off alarm
Else
Display set temperature and moisture is larger
Step 4: if x> set temperature and moisture

Display set off alarm

Else

display set temperature and moisture (no cause for alarm)

step 5: if y > set temperature and moisture

Display set off alarm

Else

display set temperature and moisture

step 6: : if z> set temperature and moisture

Display set off alarm

Else

display set temperature and moisture

step 7: End