Avanijal

Easy and Profitable Farming

Avanijal was founded in Sep 2013 to solve problems faced in agriculture, horticulture and green house using modern technology.

Problem : Indian farmers facing low income/crop yield, shortage of water, labour and electricity. Farmers lack of know how in many instances to achieve consistent and quality yield.

There is lack of data to improve crop yield, crop yield prediction, water and electricity to support proper irrigation management, pest prediction etc. All these data can be collected from sensors at the farm and can be analysed and provided to Govt and private agencies for in time action.

Back ground :

Modern irrigation techniques like Micro irrigation not only increases food productivity but also reduces the usages of resources like water. Apart from water crisis, India also has other issues like insufficient power for irrigation and surprisingly shortage for agriculture labour.

Smart Irrigation through IoT based automation enhances the crop yield while saving more water and other resources like electricity, fertilizer and labour. This is proven across the world through not just research, but commercial production of crops. Farmers in many countries with small land holding have adopted automation as well.

In India few of the progressive and rich farmers have been adopting automation since last few years. The adoption is prevalent among farmer who own Greenhouses, cash crops and Plantation estates. While lack of awareness is the biggest roadblock in adoption, the other key factors are prohibitive cost of such systems and adaptability of such systems to Indian irrigation needs such as small land holdings, quality of power available, multiple water sources etc.

There are many challenges faced by farmers and the support system.

Farmers

- Low crop yield
- Lack of agricultural labour
- Sub-optimal use of water and fertilizer
- Lack and erratic electricity

Organizations

- Lack of data on crop yield and quality before hand
- Lack of data on weather/climate conditions in case of insurers

Government

- Lack of data to provide support to farmers in terms inputs like right nutrients, pesticide.

How Avanijal is addressing the problem :

1. **Irrigation modes :**
   a. **Basic Time based irrigation**
      In basic time based irrigation, the farmer schedules his/her irrigation requirements by setting, irrigation and nutrient time duration. When the water and electricity is available, the controller feeds the required water and the nutrient based on the timing set. This is the least expensive method of managing irrigation.

   b. **Volume based irrigation**
      This is more precise irrigation as compared to time based. In time based the water delivery can change based water level and electricity conditions. In volume based irrigation, the exact amount of water will be delivered irrespective of water level and electricity conditions.

   c. **Sensor based irrigation**
      For more precise irrigation, the irrigation should be done based on soil moisture level. Number of sensors depends on the crop, soil types and accuracy requirements.

   d. **Green House Irrigation management**
      The controller provides irrigation and fertigation management for green house. The controller can also maintains temperature and humidity using temperature and humidity sensors

2. **Fertigation/Nutrient feed system support :**

   The controller supports up to 4 channel venturi/dosing system for nutrient/fertilizer feed. A single channel fertigation using a venture or fertigation pump is also supported in the basic system.

3. **Filter Back-wash support :**

   Supports 2-4 media/sand filter cleaning. User needs to have a minimum of two media filters and can go up to 4 filters.

   In basic system, the controller also supports one filter back wash. This may not be so effective but reduces frequency of manual cleaning.

4. **Protection Features :**

   Works on Phase-Neutral and Phase-Phase electricity. Supports voltage monitoring as a basic feature and this help the user set the over and under voltage protection for the motor. Protects from single-phase, phase reversal electric faults. Also supports solar powered irrigation. Valve electric measurements and detection whether a valve is wire is open or short. Optionally supports Motor dry run, pipeline pressure monitoring.

5. **Irrigation Data**

- Basic Data

  The basic irrigation statistics are stored in the controller for 1-2 years. The farmer can access at any time and he/she can reset once the crop gets harvested to re-start for next crop cycle. The irrigation and nutrient data is stored for each zone and can be cleared independently.

- Full data with time-stamped

  Optionally all irrigation, nutrient, filter and other farm data with time-stamp gets uploaded to cloud server for further analysis and actionable feedback.

Breakthrough from Avanijal

- System can be configured and monitored from mobile phone
- Wide voltage range (350-450V AC). Runs directly on single phase or 3 Phase power. No stabilizer required in most cases
- Protection of valve, motor and pipeline and warning system.
- Built-in diagnostics, remote management and on-the-air software upgrade (Jr and Pro)
- Manages irrigation based on sensors, data logging and analytics
- Adaptable to Indian farming conditions and farmer's practices
- Multi user feature for Community/Co-operative farming
- Making automation system portable through on-farm wireless connectivity (Jr and Pro).
- Patent pending product.
- Best price/feature

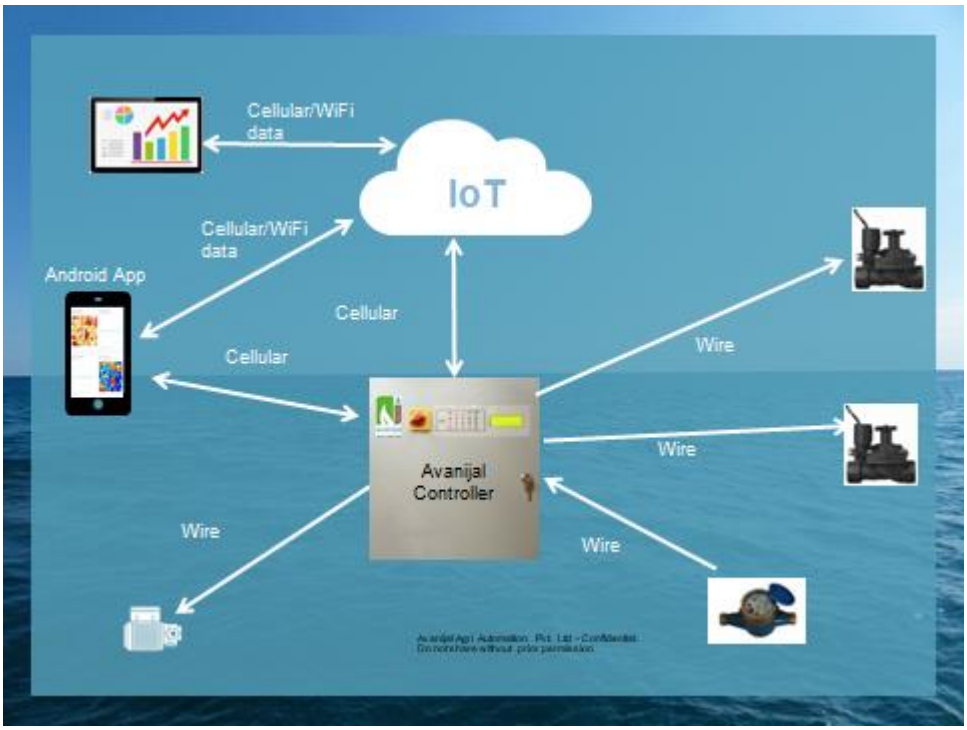

Fig 1. Overview of basic solutions

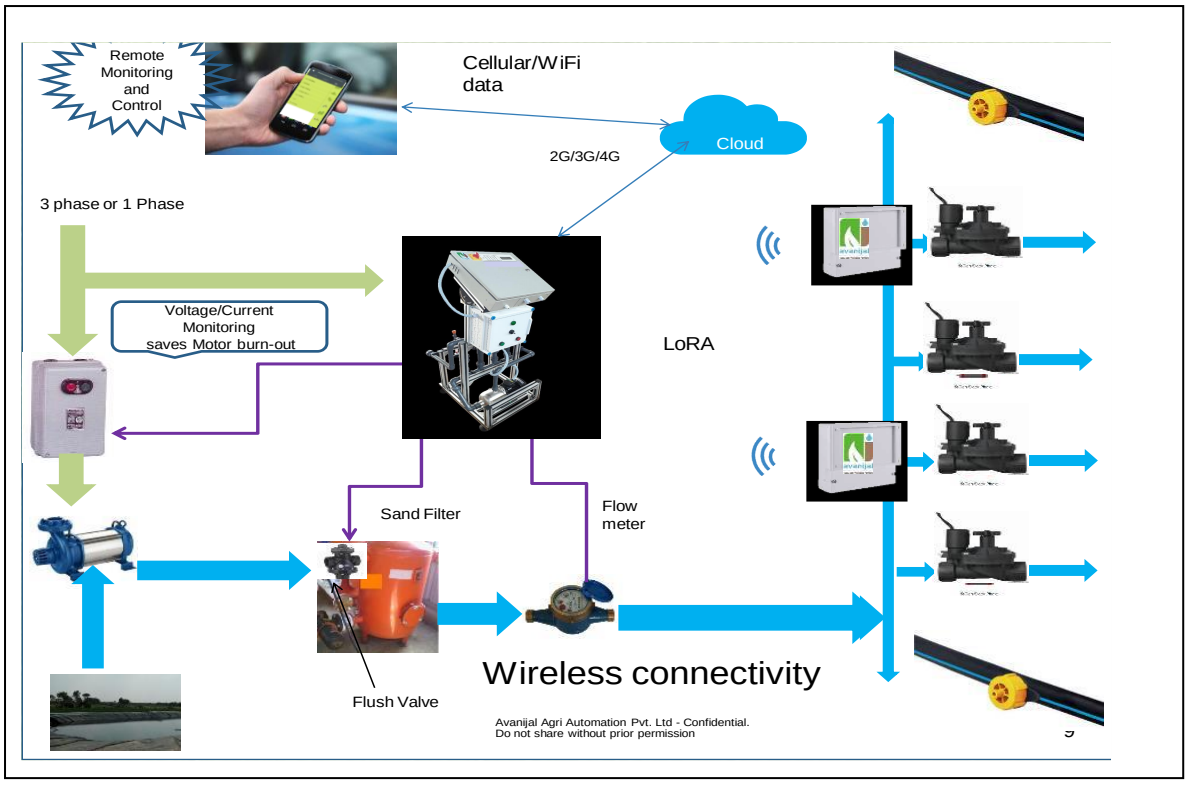

Fig 2. Overview of high end solutions with wireless valve connectivity

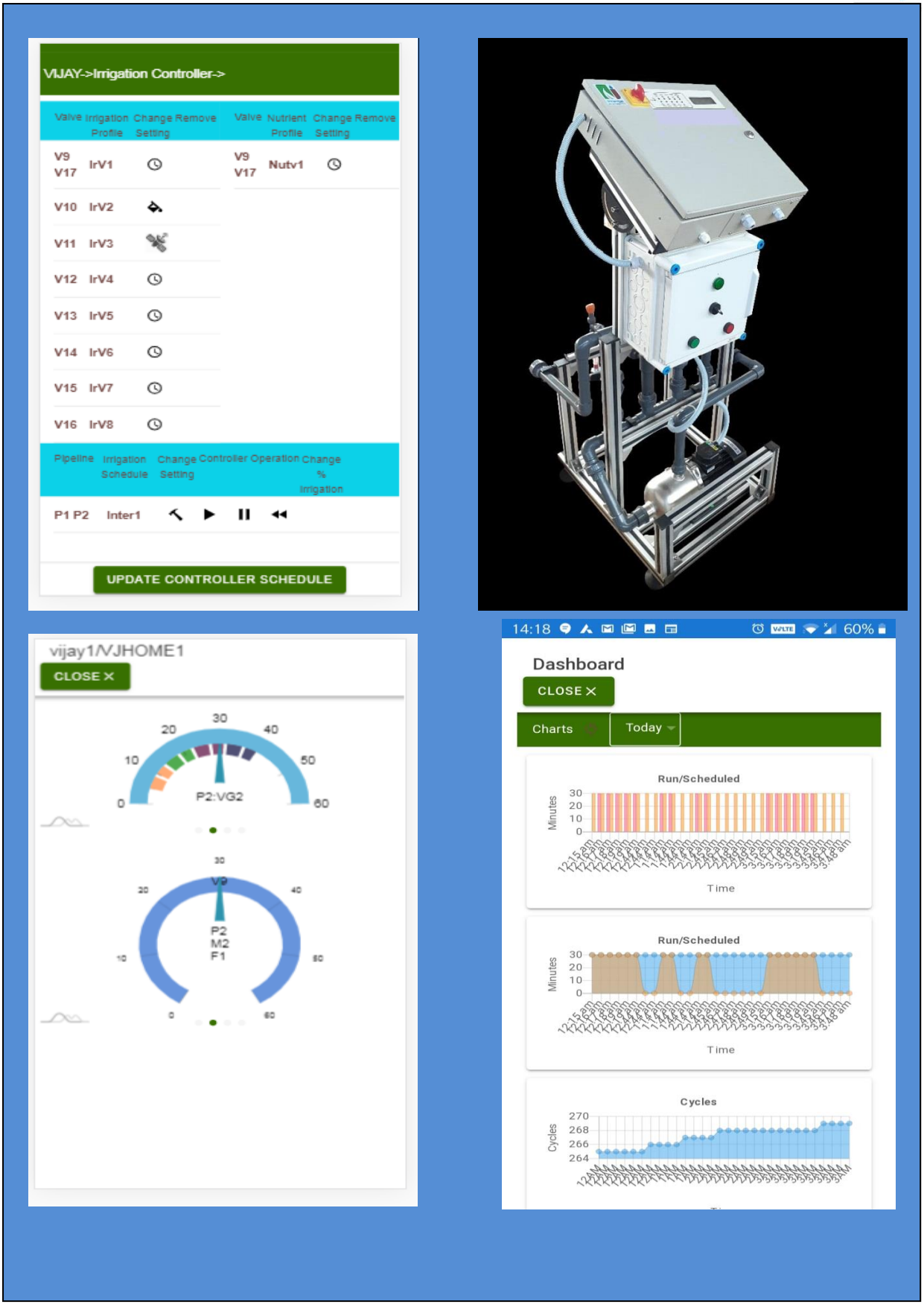

Fig 3. User configuration and data display on mobile

Value proposition for end users

- Yield/income improvements – 15-20%
- Savings in water (15-25%)
- Electricity saving (10-15%)
- Labour saving (50-60%) and
- Nutrient/fertilizer saving – 5-10%

What we sell

We sell irrigation automation solution to the end user and the Smart irrigation controller to the system integrators.

With the implementation of on farm wireless interface for controlling/sensing we can enable service provider with solutions which can be rented.

Current target market

- Farmers with 4-5 acres of above of micro irrigated open land or 1 acre and above of protected cultivation who grow medium to high value crops.
  - Crops using our solution are Banana, Arecanut, Coffee, Grapes, Pomegranate, Sugarcane, Timbre, Maize, Drumstick, Custard Apple etc.
- Govt/NGOs
- OEMs/Large corporations for white labelling
- Export markets like Latin America/ Africa

Other use cases

- Water management for village/urban local bodies
- Water management in residential layout and apartments
- Lawn and golf course water management
- Terrace/kitchen garden water management
- Industrial water management
- Spraying water to control dust in mining areas

Avanijal Media Coverage

- **US media coverage :**
  - https://www.fiercewireless.com/wireless/industry-voices-gold-iot-providing-water-security-to-a-thirsty-planet
- **Indian Media Coverage :**

- https://www.qualcomm.com/news/releases/2017/04/25/qualcomm-announces-top-eight-finalists-cycle-i-qualcomm-design-india
- https://youtu.be/T16DQobn06w
- http://indianexpress.com/article/technology/tech-news-technology/reliances-unlimit-ibm-collaborate-to-power-iot-innovation-in-india-4849412/
- https://economictimes.indiatimes.com/small-biz/startups/features/smart-farming-this-startup-has-a-new-irrigation-method-one-that-uses-just-an-app-avanijal-agritech/articleshow/62248946.cms
- https://yourstory.com/2017/07/avanijals-app-irrigates-fields/
- http://epaper.newindianexpress.com/1508912/Edex-Karnataka/22-JAN-2018#dual/2/1
- **Page# 18 of following link**
  https://www.dropbox.com/s/wg4wzr4aae85b3s/AISOctober2019.pdf?dl=0

Team - Current team size: 4 including two consultants.

Vijayeendra H S – Managing Director

Has over 25 years of experience in the industry and has contributed in various positions across engineering and management . Has been responsible for the development of Electronics Systems and Integrated Circuits. Worked in India and USA. Worked for Tata Power, Wipro, Mindtree in the past. Has keen interest in finding solutions to sub-optimal usage of resources like water, energy. Has BE degree in Electronics and Communication.

https://www.linkedin.com/in/vijayeendra-h-s-5a59956/

Channabasappa Kolar – Co-Founder

Has over 25 years of software product development experience. Worked in India and USA for product development companies. Born in farmer's family, having known the farmer’s difficulties first hand, he is very passionate about finding solution to such problems. Worked for Wipro, Fujitsu, Motorola in the past. Heholds BE degree in Electronics and Communication.

https://www.linkedin.com/in/channabasappa-kolar-4b285a96/