

## digitalization in dairy

# Digitalization at Amul: Comprehending Endless Benefits

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Digitalization or digital transformation refers to the changes in ways of working, roles, and business offering caused by adoption of digital technologies in an organization, or in the operation environment of the organization. Its major benefits are that through digitalizing, costs can be cut by up to 90 percent while improving the turnaround time multifold. Real-time data collected can be probed easily for assessing process performance, cost-drivers and also the risk factors involved. Real-time reports and dashboards empower managers to address problems before they become critical.

Kaira District Co-operative Milk Producers' Union Ltd., popularly known as 'Amul Dairy', has been the role model in empowering and improving the social status of members of dairy cooperatives. Adopting most modern technologies and innovative ideas to strengthen the cooperative principle has always been the key in assuring that Amul outrides its competitors, while successfully sailing through the economic, political, environmental, and other unforeseen factors for remarkable 75 years. And the journey continues with its ambitious plans of doubling the milk procurement by 2025-26, to become leader in Dark chocolates market and to diversify its portfolio, therefore to be able to benefit its members through stable and remunerative prices.

The future state of the dairy industry will depend on how well it responds to opportunities and risks of current market situation and what actions they take to imbibe digital culture and thus, stay relevant in the highly competitive market place. Digital technologies help identify gaps in existing products, develop new and innovative ways of product usage and packaging, and pave the way for venturing into newer markets.

### THE ERA OF DIGITALIZATION

"The recipe for success lies in combining the conventional wisdom of farmers with the expertise of professional managers and technocrats" is what were the views of the Father of white revolution, Dr. Verghese Kurien. Digitalization brings in the ease of operations, optimum resource utilizations, scope for innovation, savings

in terms of time, reduced cost, optimal supply chain and high employee productivity, leading to high customer satisfaction and preeminent revenues. It helps to bring transparency and control within the system and thus kindles flow of new ideas and innovative techniques to ensure the entire business grows in a way to stay ahead and well secured to market insecurities and unexpected commotions. The physical and digital world is converging increasingly frequently and need to work hand-in-hand, so that manufacturing companies can also become digital.

Digitalization has encroached each and every aspect of our lives, from daily chores to social networking, in schools to at big corporate houses, from online shopping to logistics and accounting. Digital technology allows making tasks faster and more accurate. With the lightning speed with which digitalization is growing, the need to engage digitally with suppliers, employees and in addition to customers is more of a compulsion for that competitive edge.

### AMUL AND THE DIGITAL TRANSFORMATION

Amul has always believed in marching ahead paving its own path while exploiting the latest technologies to ensure maximum growing revenues to its producers' while continuously catering its customers with new products imbued with the promise of best quality. At field level, we digitally capture the animal-wise information related to its history, ownership, breed details, health and productivity of over 1.3 million animals. From field to processing at plant to adopting latest technologies, automation and IT advancements at even the sales and distribution level enabled regulating the supply chain in most efficient way possible. Entire business chain is seamlessly integrated through ERPs such as SAP.

New product innovation driven by the use of digital technologies is what Amul is focusing on. The 'datafication' of agriculture is providing milk producers' the potential to obtain key information with the click of a button, and thus to make smarter day-to-day decisions to improve cow health, production and on-farm efficiencies.

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Amul has taken the following steps towards incorporating technology for continuous innovation to ensure Dairying remains sustainable for its members in coming decade:

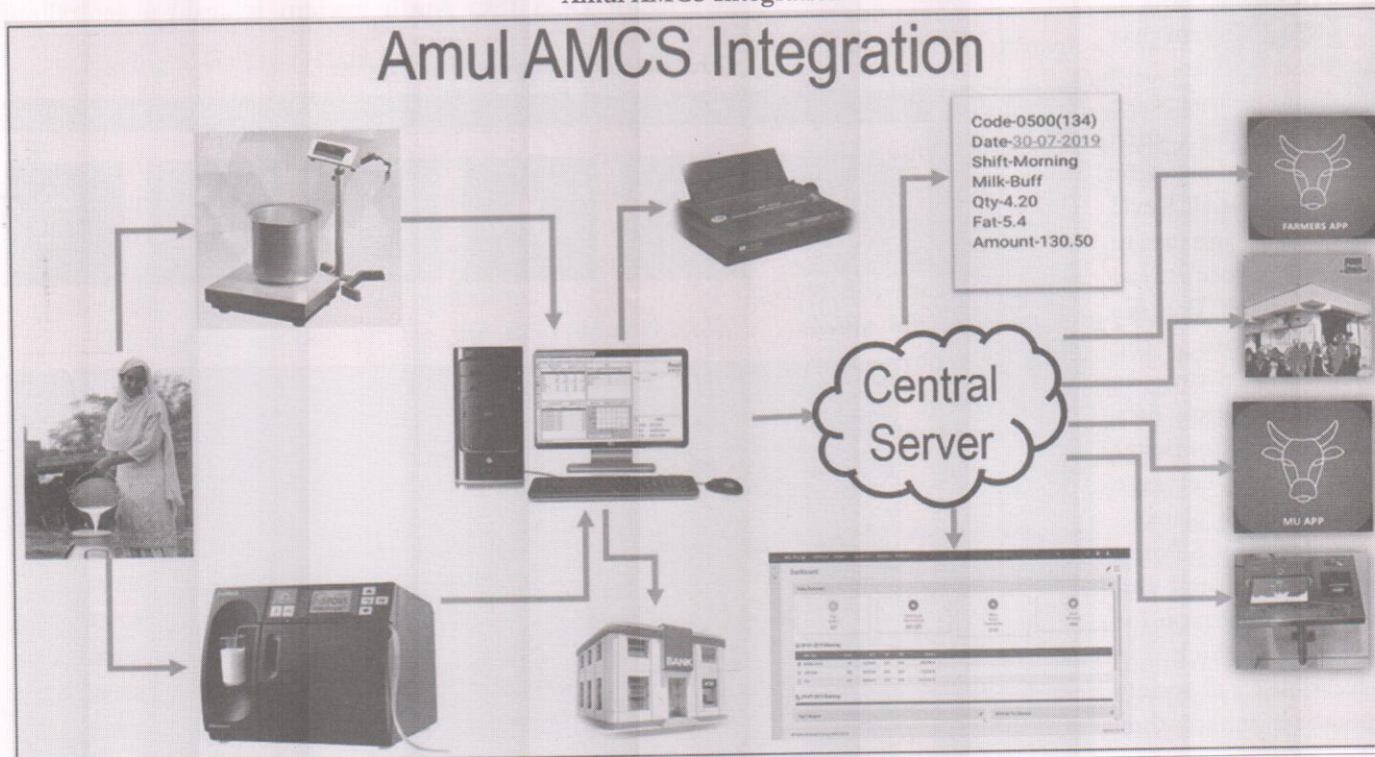
**Automatic Milk Collection System (AMCS):**

Assuredly the biggest IT intervention in the Dairy Industry, it proffers an absolute solution to Village Dairy Cooperative Societies that embarks digital transformation. With an objective to bring all three stakeholders, Farmers, the village co-operative societies and the milk unions, on a single digital platform, Amul implemented the AMCS system in its 1025 DCS by February 2017. Since then, It is operating as an end to end solution for all three stakeholders by exploiting the revolutionary digital transformation as the way to ensure ease, transparency, and ready availability of essential data.

The greatest outcome of this app for milk pourer is transparency and access to own data, and that too with one click only. Major benefits reaped are:

- The milk collection system captures exact quantity, fat and SNF of milk in real-time and automatically calculates payment of the farmer which enhances transparency.
- Milk societies can collect more milk in less time due to the milk collection software as the milk fat and SNF are calculated automatically, speeding up the milk collection process.
- The software provides direct benefits to milk producers through Cashless Payments as their bank accounts are directly linked to milk society.
- Data management is reliable and efficient as bank transactions are accurately maintained due to direct

Amul AMCS Integration



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## Client's Application

The screenshot displays the AMCS Client's Application interface. It features a navigation menu at the top with options like System, Masters, Transactions, Milk Reports, Account Reports, Favorite Menu, Window, and Help. The main content area is divided into several sections:

- Milk Collection Summary:** A table showing data for Buffalo Milk and Cow Milk across different categories (M, E) for the date 01-04-2018.
- Pending:** A table showing pending data for Milk Collection, Farmer, Farmer Mobile Mapping, Trucksheet, Shift Close, and Other Data.
- Top Farmers of April 2018:** A table listing farmer names, milk types, and litres collected.
- Monthly Summary:** A line graph showing milk collection trends for Buffalo Milk and Cow Milk from May to March.
- Updates:** A section for updates, including a notification for Jantri dated 30 Nov 2018.
- Helpline:** Contact information for toll-free (1800-1200-8580), email (support@amulamcs.com), and timing (06:00am to 10:00pm).

At the bottom, there is a footer with the text: AMUL TEST - 4043 (2018-2019) | Date: 30-07-2019 | Administrator | 30-07-2019 10:29:18 | Ver: 2.0.28.45 | localhost | Licence: Engineer

payment.

● Farmers receive instant notifications by the automatic milk collection system whenever payment is credited to their accounts, which helps them keep track of their milk business.

The system has ensured that no duplicate payments are done, along with enabling the payment cross-check at HO level too, thus ensuring desired promptness with control. For the Milk Unions, the accurate real-time as well as historical data enables them for better analysis and envisage future growth plans.

Amul DCS Portal is the web portal and android application for society, which is accessible to all society members where they

can view all circulars, milk bills & receipts, account statements, information about shares, debentures & FD, and sales invoices.

Amul Society Audit/Supervision System and Amul DCS ISO Audit system is again a centralized

## Centralize DCS Supervision System

The screenshot shows the Centralize DCS Supervision System dashboard. It features a navigation menu on the left with options like Masters, Other Master 1, Other Master 2, Allocations, Complain Master, and Gratuity Master. The main content area displays a list of online users with columns for User ID / Roll Name, Login Date, Login Time, Logout Time, Status, and View Detail.

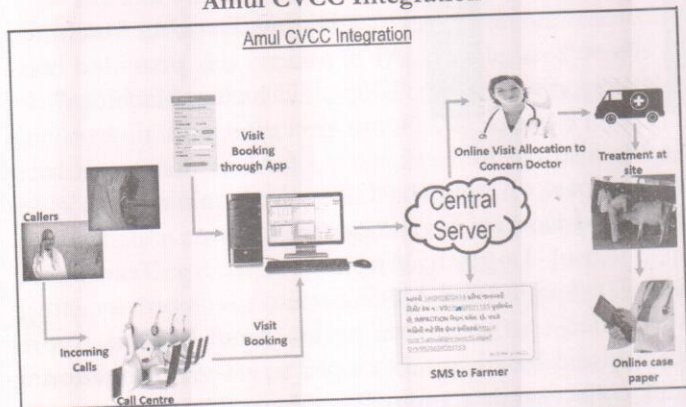
User ID / Roll Name	Login Date	Login Time	Logout Time	Status	View Detail
RNG150 / Supervisor	09-09-2020	2:22:37 PM		Online	<a href="#">View Detail</a>
DPS4076 / Supervisor	09-09-2020	4:17:56 Oct-1941A		Online	<a href="#">View Detail</a>
SPT6525 / Supervisor	21-01-2020	1:50:08 PM		Online	<a href="#">View Detail</a>
MGP2836 / Supervisor	09-09-2020	4:15:11 Oct-1941A		Online	<a href="#">View Detail</a>
DRO6519 / Supervisor	06-09-2020	7:37:52 PM		Online	<a href="#">View Detail</a>
NNC3996 / Supervisor	09-09-2020	2:23:45 PM		Online	<a href="#">View Detail</a>
NTP2385 / Supervisor	09-09-2020	12:14:50 PM		Online	<a href="#">View Detail</a>
NB80634 / Supervisor	09-09-2020	4:21:24 PM		Online	<a href="#">View Detail</a>
PDP2725 / Supervisor	09-09-2020	2:07:41 PM		Online	<a href="#">View Detail</a>
MSS2760 / Supervisor	09-09-2020	4:24:59 PM		Online	<a href="#">View Detail</a>

and online system to keep records of all societies, audit for which can be scheduled online. As the data is online, the audit is possible on real-time data and thus is much more reliable, immaculate and paperless as well.

**Amul Centralized Veterinary Call Center (CVCC):** Veterinary services are one of the indispensable and a critical service Amul provides to its Sabhasads' and is crucial to maintain the steady supply of milk to the Union as well as ensures regular income for the farmers too. Earlier these services were manually recorded and the entire communication depended upon the phone calls. This complete process took too much time for call booking, allocation and was cumbersome and time consuming for doctors also.

With a vision to hasten the entire process, a Centralized call center was made operational since Oct'2013.

#### Amul CVCC Integration



Having a facility for accommodating 40 call center operators for call booking from a network of 14 Veterinary Centers (VCs) with about 180 Veterinarians working day and night in Anand, Kheda and Mahisagar district, the call center is successfully booking calls for sick animals and AI on 24x7 basis since then. The visit booked through operator is then allocated to the veterinary doctor of the nearby route through a mobile application.

The mobile application for the field data entry pertaining to animal treatment and transport management is integrated with CVCC. All details of Animal treatment, medicine utilization, and animal details are all recorded in the mobile app. The land owned by farmer and feeding details of animals is also recorded which will act as a base for future strategies. Even the case paper is sent to farmer's mobile only, thus ensuring its available for future vis-à-vis ensuring massive paper saving.

The major benefits of this CVCC App and Call center are: quicker visit recording and allocation, reduced visit time, availability of online disease and treatment history for control, analysis and planning, and, advanced

medicine management ensuring proper medicine utilization and control. Ever since the service has started, it has been received with exhilaration and has been running effortlessly.

#### For Artificial Insemination (AI):

Initiated in March'2020, the calls for AI are also recorded in CVCC, allocated to the AI worker of the respective DCS, and closed by the AI worker once AI is done for the animal. The mobile AI App is there with all AI workers and

AI Supervisors. Over and above facilitating timely AI, alerts for repeat AI, PD and calving also are received by the farmer and respective AI worker. This also will act as a strong base for calving and milk production projections, as entire breeding history would be recorded in system. Amul Dairy is India's first cooperative to adopt digital tracking, monitoring system for artificial insemination processes.

**"Amul Pashu Seva":** Besides the facility of call center, the members now can book visits or AI through a special mobile application "Amul Pashu Seva", hence ensuring the visits are recorded fast and doctors visit promptly. Launched in Nov'2020, already 25% of the total AI calls have started to be booked through the App. We have targeted for 100% AI call booking through App from April 2021.

**Cattle Health Tracking System:** Each cattle of our Dairy Farm is equipped with activity tracker to monitor cattle health. E-sense Tag system is implemented at Calf Rearing Project, Sarsa to monitor the Heat and Health of the Heifers maintained. It gives actionable information on the reproductive, health, nutritional, and wellbeing status of individual cows and groups. Total 200 heifers are applied with e-sense tags. Tracker data is automatically collected directly on central server, which can be accessed through both mobile app as well as web based application. SMS alerts are received for parameters like estrous, intimation for AI, health status and heat stress. Graphical representation is also available



#### Mobile CVCC Application



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for above alerts.

With the efficiency of almost 100% for Heat detection, accurate health analysis and timely information of heat stress with both mobile and web based application; these tags are proving to be a big instrument for successful calf rearing at our Calf Rearing Project, Sarsa.

E-Sense Tag App Data Display

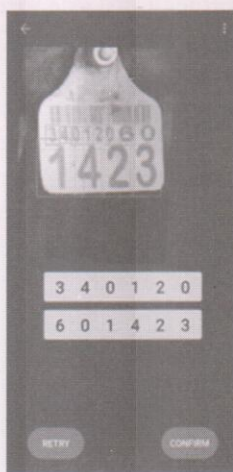


## Online Animal Tagging Application:

Impediments like lack of animal identification and traceability wedge the success of interventions undertaken for animal breed improvement, prevention activities and towards health and nutrition improvements. We, at Amul, have therefore come up with a user online animal tagging application.

To start with, we have made it compulsory to tag animals with unique tag ID before performing any intervention on them. The details of tag and related information is then fed and stored in the application, which is then integrated with other software used for AI, PD, Calving, CVCC, Fertility improvement programs, mastitis control programs, vaccinations, population counting and so on. This is also crucial for milk forecasting.

**Mastitis Prevention Program (MPP), Brucellosis Screening (BS) App, And EVP Treatment App:** Considering the importance for control and penetration to each and every cattle, MPP app, BS app and EVP treatment app also developed for use at field level. The real time data entries required for MPP app has confirmed accurate reporting and control of losses due to prevalence of Mastitis, and also makes CMT monitoring easier.



The BS and EVP treatment apps are with village resource person (VRP), who essentially use the apps ensuring high vigilance, and reduced load of the field Veterinarians.

**Software For Recording Demand Request For The Ongoing Schemes at Amul:** There are many schemes like rubber mat scheme, animal cooling system

scheme, etc. which are run from time to time by Amul Dairy for the benefit of our farmers. To avoid delays in the receipt of orders, Amul has given a facility where its field staff can collect the demand and forward it through app. This has enhanced the speed of compilation of orders multifold and also, it has become easier to implement schemes at field.

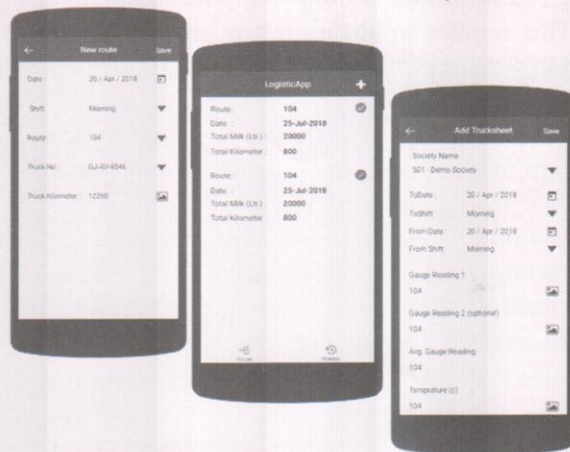
## Digital Thawing Machines:

AI workers are provided with "Digital Thawing Machines" for temp precision and time saving.

It has also ensured efficiency of AI as thawing is most critical part of Animal AI. Required trainings are given to the AI workers for the same.

**Amul Logistic App:** An app for Transporter integrated with Amul AMCS System which provides truck sheet data on the Central portal, Amul Logistic App is an Android-based app developed to assist for monitoring milk collection data and milk quality at Union and society level. The app digitizes the monitoring of truck sheets, track transporters' real-time, automate data recording, produce dynamic reports, eased route planning, store pictures along with data and control data discrepancies. It also supports offline mode to add truck sheet data at society level including GPS positioning and images. It

Amul BMC Milk Collection System



provides full surveillance on the truck drivers and milk collection to impede malpractices and adulteration as it is possible to compare milk collected at VDCCS and received through tankers.

The logistic app has digitalized the milk supply chain management format and provided a paperless process by securing all the necessary data over the cloud. It turned it as cost saving as it restricted malfunctioning executed at various level. It facilitates the collection from BMC and Cans both. It provides a dynamic report in a different format with an export option. The application even highlights the ongoing malfunctioning through colour code alerts in data. It also regulates tanker management irrespective of the number of plants. It has aided to enhance the milk received quality, and the data also is secured at the central server.

**Amul Vehicle Tracking System:** By implementing a vehicle tracking system, management get an unprecedented level of access and control to the vehicle used across all plants of Union. And being able to track every vehicle is just the beginning of all the benefits expected when GPS tracking system is used. Implemented in all the Vehicles of Veterinarians and Milk Tankers, it has reduced transportation cost, reduced operational cost, safety, reduced milk receiving timing by tracking early returned milk tanker and also has reduced overall transportation cost as it even gives alert for Geo fencing violation.

**Amul Employee Visit Tracking Software (ETS):** The field staff moving on personal/public vehicles is provided with ETS application to monitor their movement

and payment of TA bills. It is a mobile app which help in visit scheduling and monitoring. As it tracks the employee on real time basis, employee attendance is marked based on it. Also, TA bill gets generated based on actual kilometers travelled, and both TA bill and rented vehicle is paid accordingly.

### PAPERLESS OPERATIONS

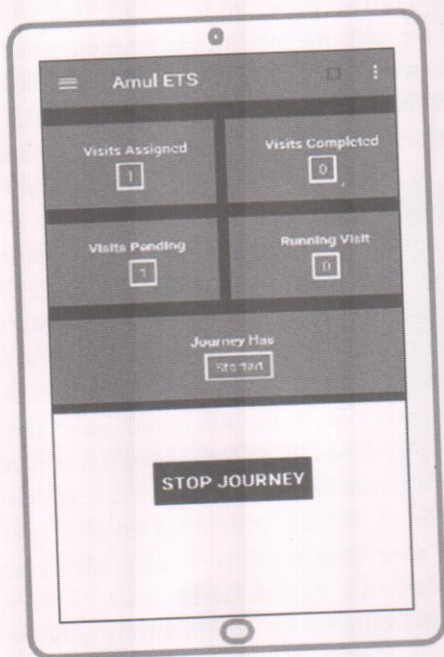
Moving from hard copy record keeping to digitalizing the system saves paper, time, facilitates housekeeping, and the information can be referred anytime in future too.

A gigantic step towards digitalization is developing a web based application converting all physical documents/ records of routine activities into digital form enabling digitization of more than 1500 formats. All these can be accessed through mobile also. This has ensured plant/section wise monitoring with single click export to XLX for further analysis.

### QR code printing on invoices:

A QR code is the simplest, and yet perfect tool to take customers from their original paper communications towards a satisfactory digital customer experience. We have given a Mobile app to scan QR code while Gate Outward. The data is captured and integrated to DIGI app. This has resulted in huge time saving as vehicle doesn't have to queue at gate. It also avoids data entry duplication.

**Amul Document Management System:** Everyday there are lot many documents which move across the organization for approvals and information. This involves



**Amul Employee Visit Tracking System**

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use of huge lot of papers and related accessories. To reduce the same, we have come up with a Document Management System (DMS) which is designed as per the individual departmental need and the document movement is based on workflow designed. This ensures quick paper movement, which is easy to track also. All the transitions are mapped with authorized officials as per policy. This has reduced resource utilized, time, and also leads to swift project implementation as approvals are faster.

**Digitalization of Plant Log Sheets:** Plant incidents are eight times more likely to occur during handovers, often due to a lack of digitized documentation regarding operations during the prior shift. Digitalization of plant log sheets enabled a centralized platform for managing the logbooks of the entire plant. It gives access to view logbooks from anywhere in Plant, connects to control systems and provides real-time visibility and trend of equipment operating data to operators. It also provides data analytics, trends, dashboards, reports and notifications.

**Employee Self Portal:** It is an in-house user friendly software to ensure online Performance Management of employees, leave requisition and approval, Kaizen forms submission, tour management, meeting management, Insurance portal and event management. All necessary information, ID and photograph of the visitors is recorded in the visitor management system, which then sends an E-mail as well as SMS alert to the officer the visitor is supposed to meet. The officer only can then close the visitor trip at last.

**Warehouse Management System:** This has been remarkable to achieve a paperless environment that directs

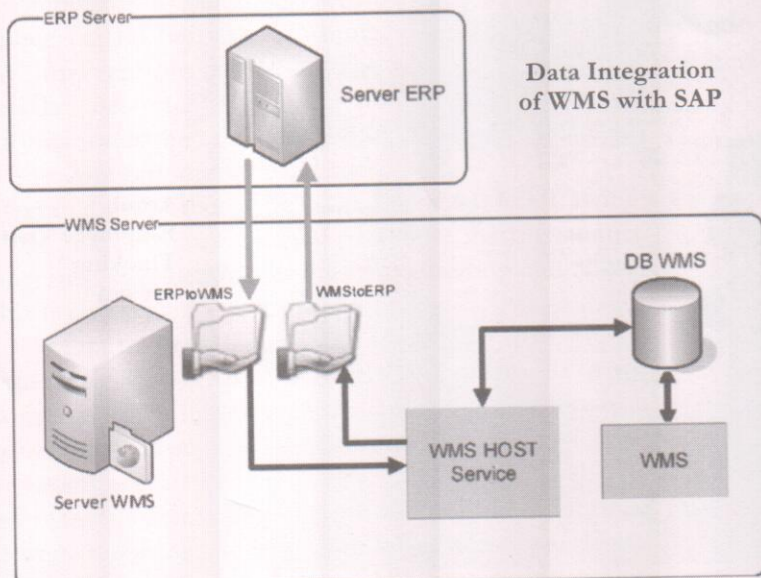
employees for optimal picking, put-away and shipping of the products automatically. No manpower is involved in its management once the finished goods are kept into the pallet. Only SKU and batch number needs to be entered to stack or retrieve the goods from the warehouse. The WMS can store a total of 3969 pallets, leading to a storing capacity of about 2500 Mtr. Ton. of finished goods. It is integrated with SAP and thus is seamlessly functioning since its installation for finished goods at our Dr. Kurien Cheese Plant, KSD, Khatraj.

**Amul File Management System:** At Amul, we have adopted a File Management System where online record and tracking of physical file stored in Mobile Racks is integrated with the Document Management System. A congregated physical document storage with single window in-out, the file management system has given control of space, ease of document retrieval and ensured secure document storage.

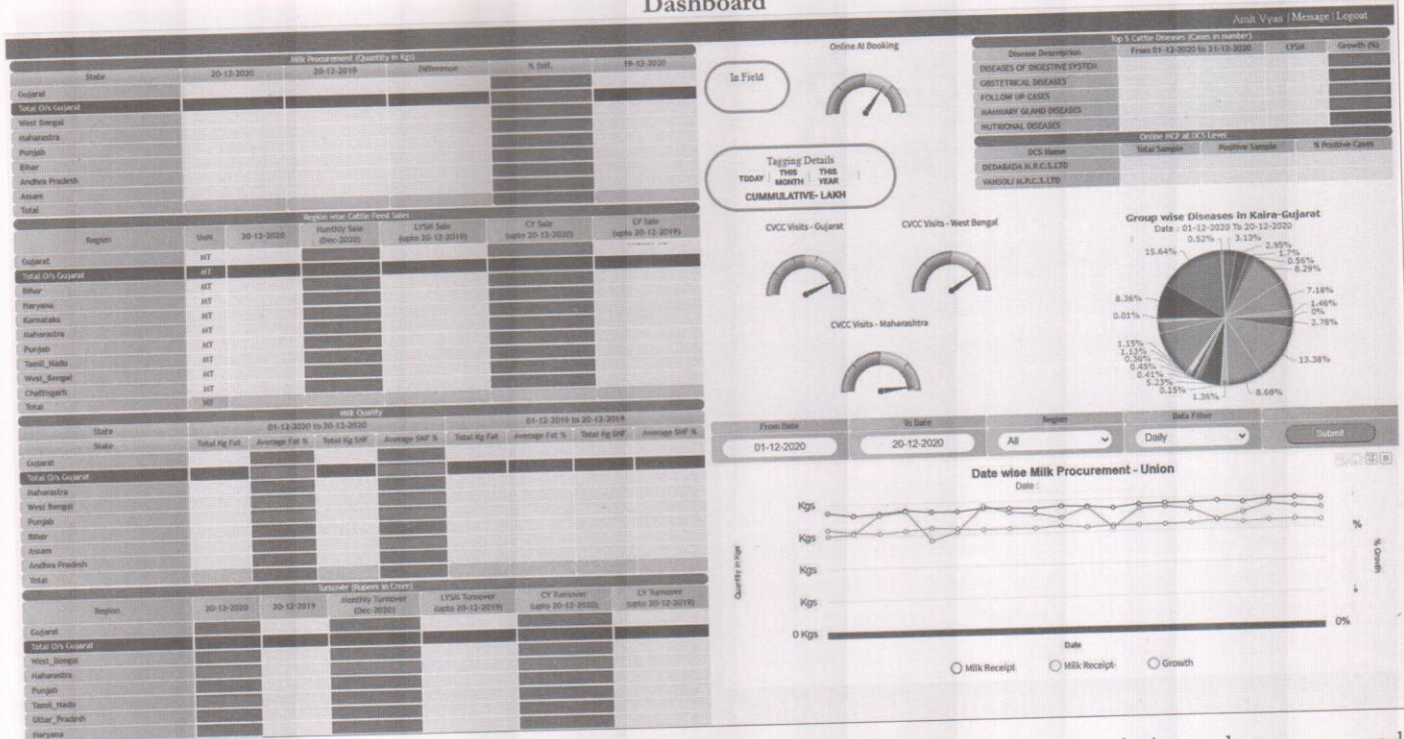
**Amul Dashboard:** Making valuable decisions has always been one of the most important things in business and those decisions are made based on numbers and their analysis. A dashboard is the best tool that gives business leaders valuable information, and it provides a quick outlook of all the most valuable numbers, which allows business leaders to perform accurate business analysis.

It is where the Amul Dashboard proves advantageous. It displays real time information about region wise milk procurement and its quality, total field staff at any moment of time, animal tagging summary, group-wise animal diseases treated, total calls received of treatment and AI through CVCC, mastitis control program summary, sales quality, Major SKU wise closing stock, cattle feed sales, and product wise sales. So, this is the handiest and accurate tool available on real time basis with Management to monitor the overall operations as well as to take strategic decisions for future course of action.

Envisioning to double the milk production in next 5 years, for the first time in India, Amul has started Embryo Transfer (ET) at our CRP, Sarsa Farm, and AI with Sex sorted semen (SST) at field level. This is first such initiative taken up by cooperative in India where we have targeted to use 2 lakh doses of SST till March itself. Along with it, Calf rearing project is also taken down to the field level. Though this does involve cost, we are very sure that with very diligently planned action plan, an enthusiastic team, and well-coordinated efforts, we would surely achieve our



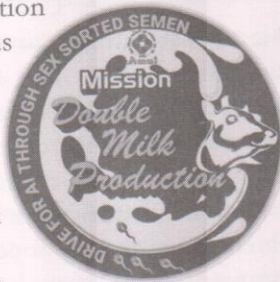
## Dashboard



goal of doubling the milk production in our milk shed area, and thus would be able to make Dairy business more sustainable for our milk-producers.

The potential benefits of digitalization include improved business process efficiency, quality, and consistency while eliminating manual steps and better accuracy. It also enables a better real time view on operations and results, by integrating structured and unstructured data, providing better views on organization data, and integrating data from other sources. Furthermore, it can lead to better work satisfaction for employees through automation of routine work, thus freeing time to develop new skills. Digitalization also improves compliance via standardization of records and improves recovery via easier backups and distribution of storage.

Adopting enterprise-wide Integrated Application System (SAP) to align various sub software systems in place has provided Amul the edge for ensuring unceasing milestones and to envisage the



### Envisaging Double Milk Production



Newly Born ET Calf

desired action plan with more clarity and accuracy, and thus it is not a surprise that the height of targets taken has always increased exponentially every year for the Union.

Either it is innovation or using advanced technologies or Artificial Intelligence or Digital interventions, Amul very well knows how to respond to the opportunities and risks of market, to fuel innovation and to stay relevant in the highly competitive market place, and has evidenced its commitment to ensure profit and sustainability for its milk producers' continually.



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