IT in Power Sector- Distribution

Presentation by:
Feedback Ventures Pvt Ltd

Agenda

- Distribution Business
- Current Challenges
- Implementing IT
- Change Management

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Distribution Business

Distribution Operations

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Current Challenges

Present Scenario

- Problems faced by Electricity Utilities
  - High energy losses/ Theft of energy
  - Lack of Accountability
  - Issues relating to quality & reliability of supply
  - Billing and Commercial inefficiencies
  - Manual and Cumbersome Processes
  - Quality and level of staffing

- Results:
  - Consumer Dissatisfaction
  - Inefficient Operation and poor maintenance of system management of commercial parameters
  - Substantial Revenue Leakages. Huge and ever-growing amounts stuck in PD cases.

Areas of Improvements

- Current Process that are considered to be critically in need of overhaul in most of the Distribution Companies
  - Business process efficiency
  - ATC loss reduction
  - Metering, billing and collection efficiency
  - Substations Management
  - Total energy accounting
  - Better customer relations and consumer satisfaction
  - Capacity building and operational efficiency

Solutions in Indian Sector

- Indian Power sector has tried many IT solutions which gave quick wins

Business / Application Areas and Initiatives	Organisations
Use of distribution automation such as SCADA, substation automation and data acquisition technologies	APSEB (Hyderabad City), BSES, CESC, KSEB (Thiruvananthapuram city), RSEB (Jaipur City), TNEB (Chennai City), WBSEB (Jalpaiguri Circle)
Automated Meter Reading (AMR)	AP Transco (pilot basis), BEST, BSES, MSEB, Tata Power
Use of handheld devices in the field	APSEB (CESCO), BSES, MSEB, UPSEB
Customer Information System	AEC, AP (CESCO), BSES, CESC, MSEB
Call Centre System	BSES, CESC, APSEB (Hyderabad City)
Billing System	Most SEBs
Energy Accounting System	MSEB (in urban areas)

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Implementing IT

What to cover in IT Plan

- New Systems Requirement
  - **Essential System** -These are the most important process that will give long term robustness to the Distribution business as seen by the Management
  - **Optional Systems** -There could be few process that need not directly impact the performance of the business and are understood as optional.
- Segregation criteria
  - Cost to the business of the IT products
  - The Returns expected
  - Expected life of the IT solution

Where IT Can Play a Role

Asset, Inventory and Purchase

- EAM
- Fixed assets
- Inventory
- Maintenance Management
- Fabrication Process
- Operations
- Projects
- Purchasing
- Demand Planning

Human Resource Mgmt

- Core HR
- ESS
- MSS
- Payroll
- HRMS
- Annual Appraisal

Financial Mgmt

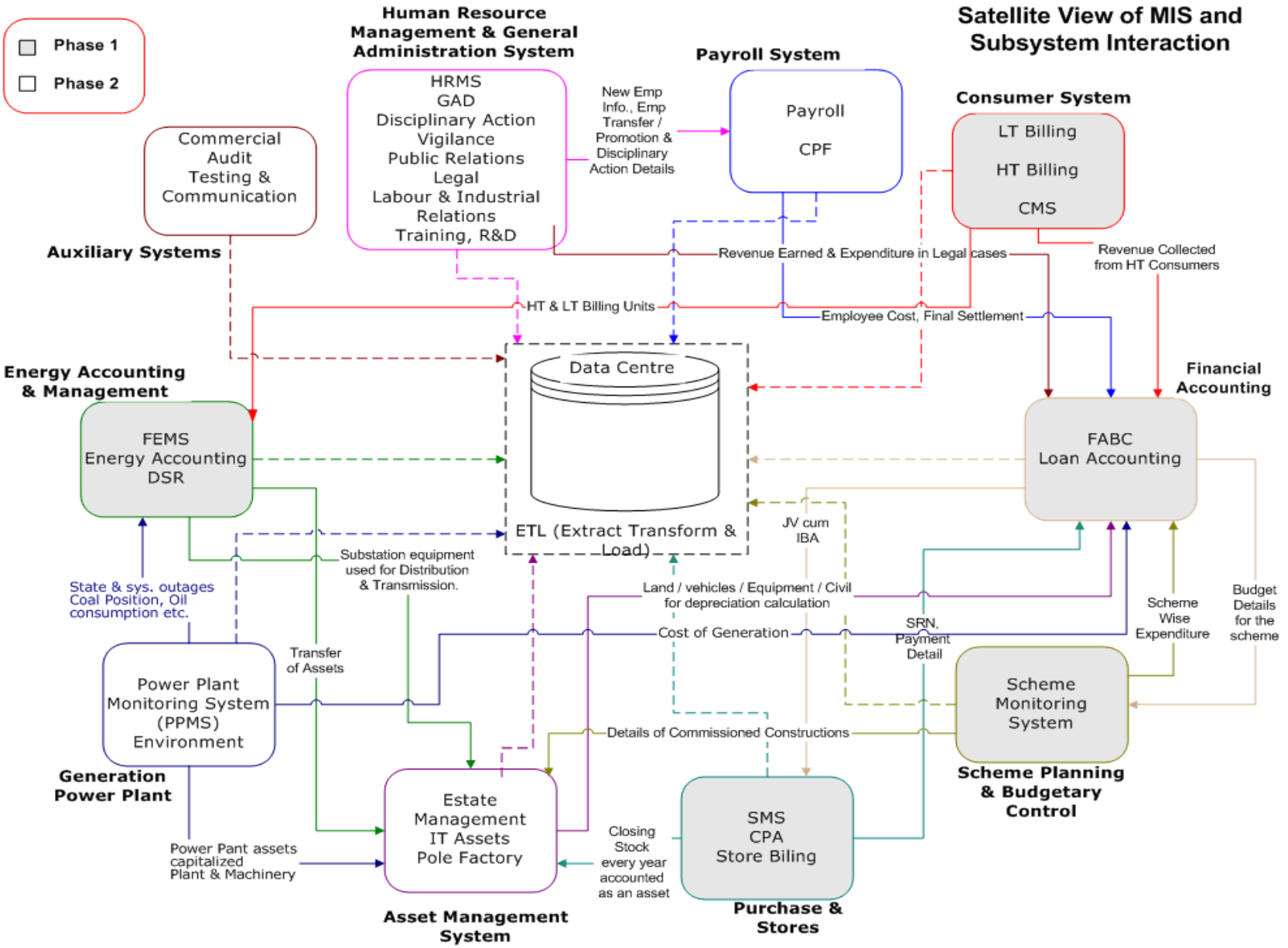
- Account Payable
- Account Receivable
- Cash Management
- General Ledger
- Treasury

Customer Relationship Mgmt

- Consumer Database
- New Connections
- Disconnection / Dismantling

MBC Systems

- Billing
- Collection
- Metering


Satellite View of MIS and Subsystem Interaction
Phase 1
Phase 2
Human Resource Management & General Administration System
HRMS
GAD
Disciplinary Action
Vigilance
Public Relations
Legal
Labour & Industrial Relations
Training, R&D
New Emp Info., Emp Transfer / Promotion & Disciplinary Action Details
Payroll System
Payroll
CPF
Consumer System
LT Billing
HT Billing
CMS
Commercial
Audit
Testing &
Communication
Auxiliary Systems
Revenue Earned & Expenditure in Legal cases
Revenue Collected from HT Consumers
HT & LT Billing Units
Employee Cost, Final Settlement
Data Centre
Energy Accounting & Management
FEMS
Energy Accounting
DSR
Financial Accounting
FABC
Loan Accounting
ETL (Extract Transform & Load)
JV cum IBA
Substation equipment used for Distribution & Transmission.
State & sys. outages
Coal Position, Oil consumption etc.
Land / vehicles / Equipment / Civil for depreciation calculation
Cost of Generation
SRN, Payment Detail
Scheme Wise Expenditure
Budget Details for the scheme
Transfer of Assets
Power Plant Monitoring System (PPMS) Environment
Details of Commissioned Constructions
Scheme Monitoring System
Scheme Planning & Budgetary Control
Generation Power Plant
Estate Management
IT Assets
Pole Factory
SMS
CPA
Store Biling
Power Pant assets capitalized
Plant & Machinery
Closing Stock every year accounted as an asset
Asset Management System
Purchase & Stores

IT Rollout Strategy

- Modular
  - Good for small & already defined IT project
- Complete
  - Complete revamp of the business processes but is

Solutions available:

- Off the Shelf
  - These are already tried and tested solutions can be implemented with less time and cost
- Customization based
  - These solution need little tweaks and modifications according to business requirements, thus providing flexibility to continuously evolving processes

Envisaged TO-BE System

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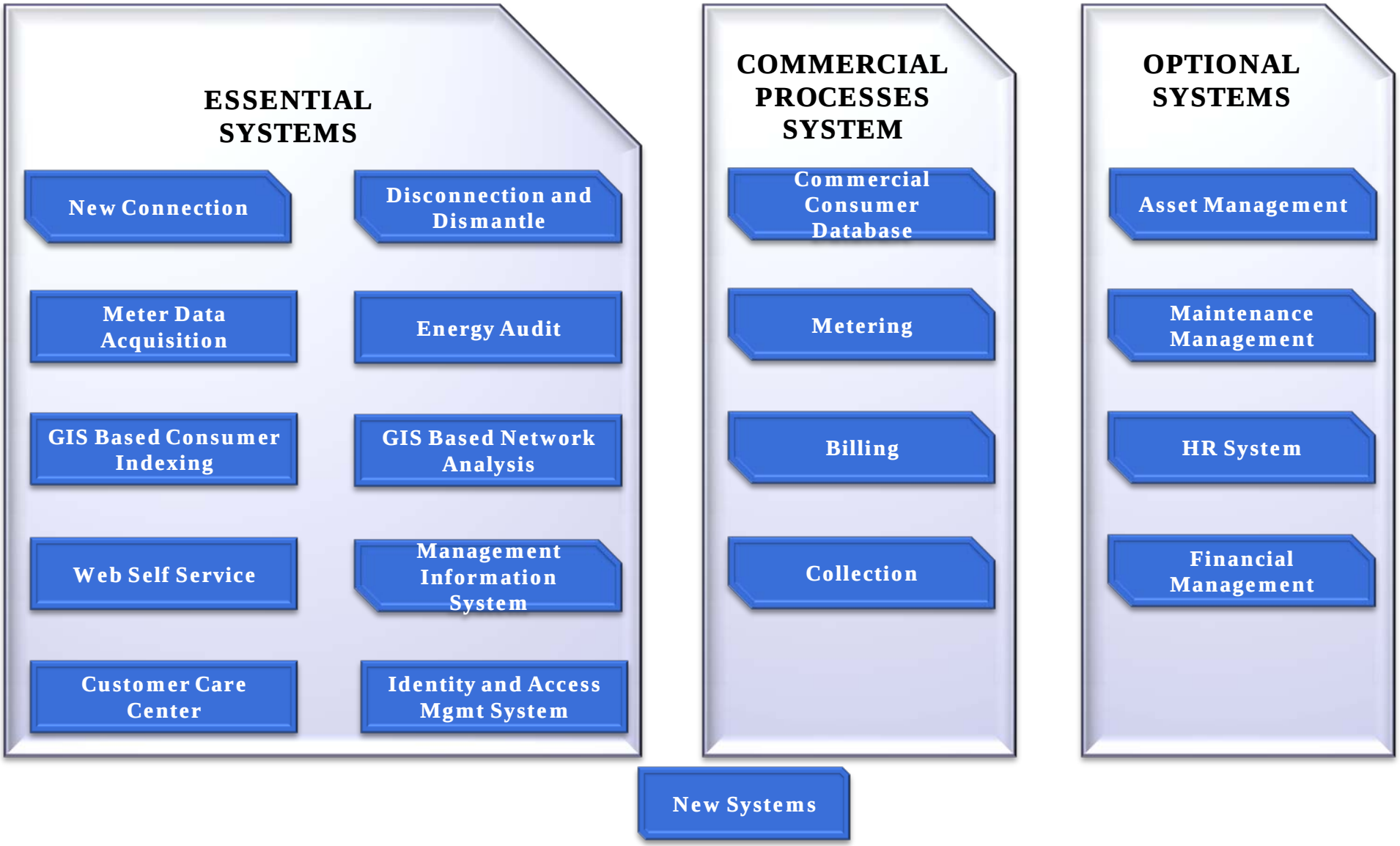

Meter Data Acquisition

- Automating the meter data acquisition is very important to cut the time in capturing the information for support processes. The Building blocks are
  - Communication technology- hardware and software
  - Provision of decision support
  - Alerts and tamper information
  - Utilization for support processes
  - Timely information of health of the meters

Energy Audit

- Unaccounted Energy is loss to distribution
  - Collection of Energy flow data from metering modules
  - Provisions for bus-bar and transformation losses in sub station
  - Calculation of DT losses
  - Calculation of HT losses
  - Provisions for network reconfigurations
  - Data analysis and AT& C losses estimation considering the metered/unmetered sales

New Connection

- Customer expects quality and timely service
  - Electronic forms of new connection
  - Accepting registration fee details
  - Application number generation
  - Inspections report and connection release information's
  - Customer communication for status and updates

Disconnection & Dismantling

- Easy and Quick service is always welcome for departing customer
  - Generation of defaulters list
  - Action taken reports and updating
  - Accepting applications electronically
  - Integrated settlement with supported modules like accounts and asset management
  - Final bill issuance and settlement

GIS based Consumer Indexing

- Consumer base keeps on expanding
  - GIS solution can help consumer tracking
  - Consumer coordinates can be mapped with help of technology and further be utilized for supporting processes
  - SLD creation of network and assets
  - Sorting, viewing and geographic
  - Manual Layering capabilities

GIS based Network Analysis

- It is very useful for Distribution company if the network analysis jobs are done with help of intelligent system
  - Creation, editing of networks
  - Load flow, voltage drop analysis
  - Optimum designing parameters with three phase, two phase and single phase systems
  - Actual mode vs

Centralized Customer Care Services

- Segregation of customer interactions
- Integrated CCC with other departments and unique customer number
- Data analysis and customer support
- Single window concept
- Technology and capabilities
- Automatic call handling and escalation system
- Reports and tracking

Management Information System(MIS)

- Efficient MIS is the need of today's business
  - Integration of People/ Processes & technology
  - Robust & Centralized MIS
  - Multi dimensional view
  - Extensive data visualization
  - Relevant Historical data
  - Simplifies reporting & analysis

Web Self Service

- Making information available to the target end user with help of IT
  - Registration, Login and identity management for users
  - Account customization
  - Consumer related information, critical issues like due dates etc.
  - Bill Payment options
  - Complaints registration and customer support
  - Commercial information's, application status etc

Identity & Access Management System

- Management of users and rights with help of IT
  - User repository
  - Categorization of users in logical groups with relevant rights
  - Access management
  - Data Protection
  - Communication usage restriction
  - Restricted access to resources
  - Policy implementation and user management
  - Retrieving of account information

System Security Requirement

- Security play an important role in IT systems
  - Tracking key system accesses
  - Time stamping and auditing feature
  - Disaster recovery
  - System integrity
  - Confidentiality
  - Network and data transfer
  - Security schemes

Metering, Billing & Collection

- The very core business of the Distribution can be revamped by automating the MBC system
  - Metering data collection and validation
  - Automatic bill generation for different consumer categories with different logic
  - Collection, arrears adjustment, bill correction activities
  - Integration between Metering, billing and collection

Asset Management

- Distribution companies have assets scattered in far flung areas and of different life
  - Keeping identity of the assets
  - Tracking the location and health of the asset
  - Multiple asset grouping and their management
  - Electronic tracking of inventory
  - Tracking of insurance status and values
  - Up gradation, maintenance and replacement records
  - Online search and tracking with help of bar codes etc
  - Integration with GIS system

Maintenance Management

- There are large volumes of maintenance work at any point of time
  - Coordination between maintenance works
  - Planning maintenance and shutdowns
  - Forecasting future corrective works
  - Automatic creations of maintenance work orders
  - Automatic creation of schedules and maintenance duty sequences
  - Integration with Materials, HR and Finance

Distribution Automation System

- All the tools required such as Computers, Remote Terminal Units (RTUs), breakers, Switched Capacitor Banks, OLTC Transformers, Auto Reclosures, Sectionlisers, AMR Systems and Communication Systems are available.
  - Distribution Transformer control
  - Monitoring and Control of LV breakers
  - Supervisory Control and Data Acquisition (SCADA)
  - Historical Accounting and Reporting
  - Load Control of HT consumers
  - Automatic Meter Reading
  - Feeder SCADA including fault localization, restorations of supply and load balancing
  - Integrated volt/VAR control
  - Automatic Mapping and Facilities Management
  - Trouble Call Management System

SCADA

- **SCADA (Supervisory control & Data Acquisition)**
- The system mains comprises of
  - Control Centre equipment
  - Application software
  - Distribution Management Software
  - Communication System
  - RTUs for field data acquisition
  - UPS

SCADA is more effective if integrated with load control, AMR, emergency load shedding, integrated Var Control, fault location through sectionalisers, trouble call management, and facilities management.

Challenges in adopting IT

- The market today is full of solutions with varying capabilities as well as limitations and it is important choose the appropriate technology, as per the business requirements, at the right time for the right set of applications.
- The selection of IT systems and tools should be based on long-term strategic and business continuity perspective. The following factors are critical in any IT implementation:
  1. Adoption of open architecture and adaptive communication network based on proven standards and specifications
  2. Geographical challenges can have different impact on adopting the IT solution
  3. Consistent infrastructure for data collaboration, communication and interoperability
  4. Authentication and role-based access to the network
  5. Robust and scalable architecture to support large volume of transactions
  6. 3-tier architecture for easy modifications of business logic and SW deployment
  7. Platform-independent application components for easy migration to new platforms
  8. Disaster Recovery and Continuity Planning
  9. Most important keeping the IT infrastructure evolving with time.

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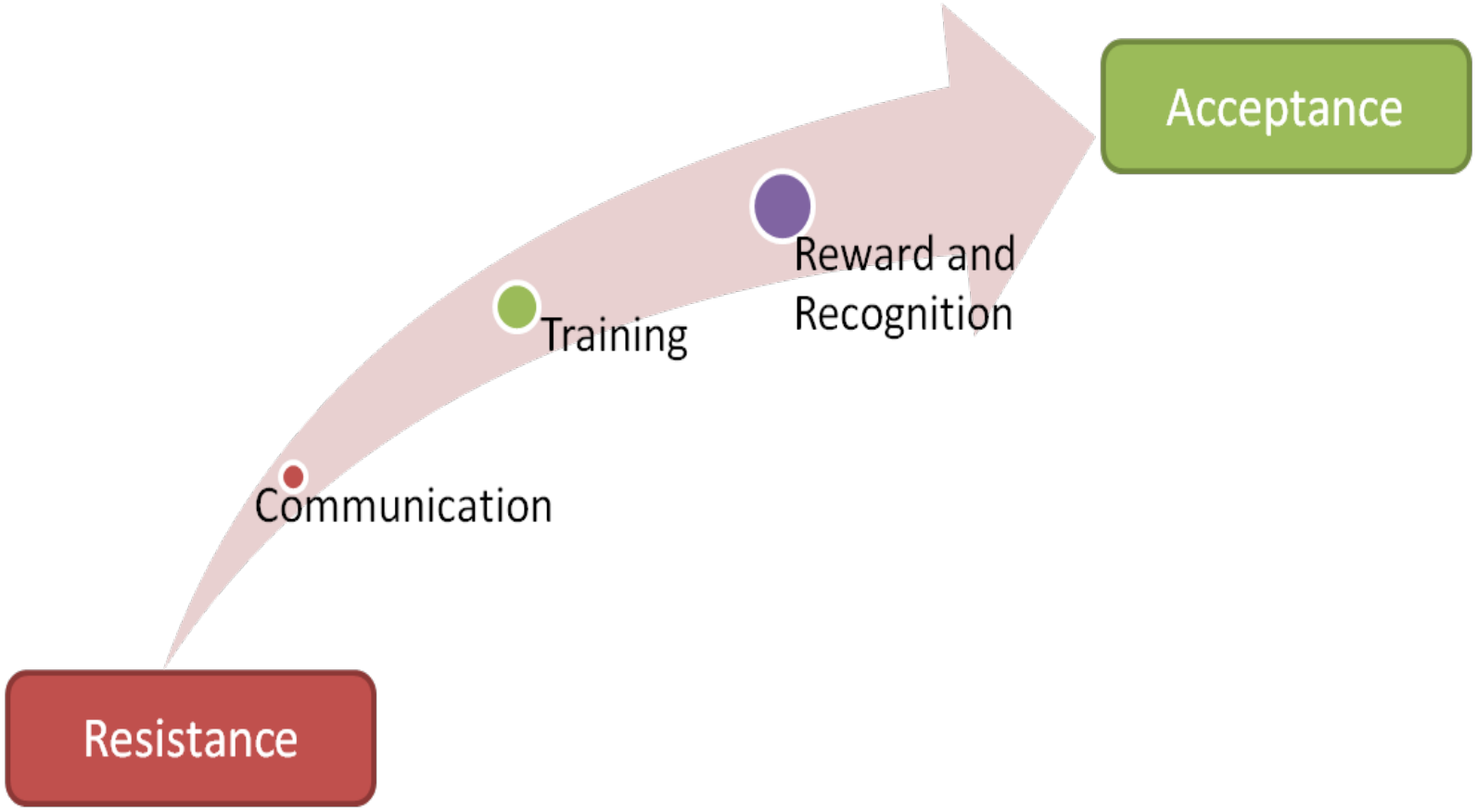
Change Management

Resistance to IT

- Resistance to change-Normal tendency in Humans
- Some of the scenarios which may lead to resistance to change are:
  - If the nature of the change is not made clear to the affected employees.
  - If the change is open to a wide variety of interpretations.
  - If some negative forces, internal or external to organization, are working to fail the system.
  - If there are strong organizational and de-motivating forces deterring an employee from accepting the change.
  - If the employees have pressure put on them to adopt change instead of having a say in the nature or the direction of change.
  - If they perceive that change is made on personal grounds, that is, as part of someone's personal agenda.

Resistance to Acceptance



Managing Change

- Communication
  - It is very important to make aware the end user the needs and his role in implementing the IT solutions for the business
- Training/Capacity Building
  - Training becomes the best tool of changing the process through virtual/actual practice by the end user
  - These can be in house or professional practices
- Reward and Recognition
  - The employees who relatively more resistive than others can sometime motivated to accept change through Rewards and recognitions.

Thank you