6.1 Project Approach

Management Information System (MIS) project approach addresses the needs of Uttar Pradesh Irrigation Department (UPID). The implementation of the recommendations will require commitment of financial as well as manpower resources from UPID. This calls for a well-conceived, integrated yet flexible plan coupled with strong management control to ensure its success. Keeping this in mind, a phased implementation approach is recommended, with emphasis on the following:

- Phased development and implementation of application systems
- Incremental acquisition of technology
- Retaining and protecting the existing investments wherever possible

The MIS project approach will:

- Provide UPID with the appropriate time to stabilise while the personnel undergo skills upgrade program and the new systems are being analysed and designed
- Minimise disruptions to the end users and aid assimilation of new technology into UPID culture through change management initiatives
- Facilitate modular upgrades to accommodate increased requirements arising out of unforeseen circumstances
- Provide an opportunity for acquiring updated technology

An implementation approach best suited for UPID for its executive functions, technical functions and communication needs in order to implement management information systems is discussed.

The approach has also taken into account the strengths and weaknesses of UPID. Strengths and weaknesses have been identified during the study of UPID (refer Appendix K).

The project approach broadly details out the priorities for the development of the application system, approaches for software development, implementation, quality management, transition management, training, risk management etc.

6.1.1 Application System Priorities

It is necessary to prioritise the implementation of the application systems identified earlier, keeping in mind the resources allocated for information systems may be
limited. The prioritisation should take into consideration the immediate and long-term objectives of UPID.

The system implementation priorities were determined based on the following prioritisation criteria:

?? Potential Benefits
?? Impact
?? Demand for the system
?? Likelihood of Success

6.1.1.1 Evaluation Process for UPID

Each broad application system area was evaluated on the above four criteria on a scale of 1-9 (1 represents the lowest rank and 9 the highest).

The basis of ranking is as stated below:

?? Potential Benefits
Potential benefit depends on the extent to which the application system will help to achieve the objectives of UPID. An application system having a high impact on a high priority business objective will have a high potential benefit.

?? Impact
This implies the impact of systems on achieving departmental, managerial and operational efficiency. Criticality of information need for operational, tactical and strategic control and the extent to which it is catered to by an application system. More the number of critical needs catered to by the application systems, higher will be the ranking.

?? Demand for the system
Demand for the system is driven by:

- Internal factors such as demand for new and improved systems by end users and their urgency of implementation
- External factors such as changes in government regulations and support offered by hardware and software vendors

?? Likelihood of success
The pre-requisites, timescales involved, implementation easiness and resource availability with UPID were considered to evaluate the likelihood of successful implementation.

Table 6.1 presents the rankings of broad application system areas and the priorities arrived at after discussion with UPID. Depending upon the total, the application
systems have been prioritised into two groups – First Priority Group and Second Priority Group.

Table 6.1
Application System Priority

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Broad Application System Area</th>
<th>Potential Benefits</th>
<th>Impact</th>
<th>Demand</th>
<th>Likelihood of Success</th>
<th>Total</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Financial Accounting</td>
<td>9</td>
<td>9</td>
<td>8</td>
<td>6</td>
<td>32</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Audit and Draft Para Management</td>
<td>6</td>
<td>5</td>
<td>6</td>
<td>5</td>
<td>22</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Contracts Management</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>20</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Human Resource Management</td>
<td>7</td>
<td>9</td>
<td>9</td>
<td>5</td>
<td>30</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>Payroll Accounting</td>
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<td>9</td>
<td>8</td>
<td>6</td>
<td>32</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>Litigations Management</td>
<td>9</td>
<td>7</td>
<td>8</td>
<td>8</td>
<td>32</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>Stores Accounting</td>
<td>8</td>
<td>7</td>
<td>8</td>
<td>5</td>
<td>28</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>Revenue</td>
<td>9</td>
<td>7</td>
<td>9</td>
<td>7</td>
<td>32</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>Budgeting</td>
<td>9</td>
<td>8</td>
<td>8</td>
<td>5</td>
<td>30</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>Procurement and Tender Management</td>
<td>8</td>
<td>6</td>
<td>6</td>
<td>5</td>
<td>25</td>
<td>2</td>
</tr>
<tr>
<td>11</td>
<td>Assembly and Parliament Questions and their Reply Management</td>
<td>9</td>
<td>7</td>
<td>7</td>
<td>8</td>
<td>31</td>
<td>1</td>
</tr>
<tr>
<td>Sr. No</td>
<td>Broad Application System Area</td>
<td>Potential Benefits</td>
<td>Impact</td>
<td>Demand</td>
<td>Likelihood of Success</td>
<td>Total</td>
<td>Priority</td>
</tr>
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<td>-------</td>
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</tr>
<tr>
<td>12</td>
<td>Asset Management</td>
<td>8</td>
<td>7</td>
<td>8</td>
<td>5</td>
<td>28</td>
<td>2</td>
</tr>
<tr>
<td>13</td>
<td>Irrigation &amp; Water Management</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>8</td>
<td>35</td>
<td>1</td>
</tr>
<tr>
<td>14</td>
<td>Drainage Improvement and Maintenance</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>7</td>
<td>34</td>
<td>1</td>
</tr>
<tr>
<td>15</td>
<td>Flood Control and Management</td>
<td>9</td>
<td>9</td>
<td>7</td>
<td>7</td>
<td>32</td>
<td>1</td>
</tr>
<tr>
<td>16</td>
<td>Investigation and Planning</td>
<td>7</td>
<td>6</td>
<td>6</td>
<td>7</td>
<td>26</td>
<td>2</td>
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<td>17</td>
<td>Design of Works</td>
<td>9</td>
<td>8</td>
<td>8</td>
<td>7</td>
<td>32</td>
<td>1</td>
</tr>
<tr>
<td>18</td>
<td>Construction of Projects</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>28</td>
<td>2</td>
</tr>
<tr>
<td>19</td>
<td>Mechanical Works</td>
<td>8</td>
<td>8</td>
<td>6</td>
<td>7</td>
<td>29</td>
<td>2</td>
</tr>
<tr>
<td>20</td>
<td>Dam Safety Monitoring</td>
<td>8</td>
<td>7</td>
<td>6</td>
<td>7</td>
<td>28</td>
<td>2</td>
</tr>
<tr>
<td>21</td>
<td>Monitoring and Evaluation</td>
<td>9</td>
<td>8</td>
<td>8</td>
<td>7</td>
<td>32</td>
<td>1</td>
</tr>
<tr>
<td>22</td>
<td>Research Activities</td>
<td>8</td>
<td>7</td>
<td>6</td>
<td>7</td>
<td>28</td>
<td>2</td>
</tr>
</tbody>
</table>

On above mentioned applications and related data, Decision Support System (DSS) will be developed.

Table 6.2 lists the application systems based on the priority of implementation.

**Table 6.2**

**Priority Groups**
### First Priority Group

- Financial Accounting
- Human Resource Management
- Payroll Accounting
- Litigations Management
- Revenue
- Budgeting
- Assembly and Parliament Questions and their Reply Management
- Irrigation & Water Management
- Drainage Improvement and Maintenance
- Flood Control and Management
- Design of Works
- Monitoring and Evaluation

<table>
<thead>
<tr>
<th>Second Priority Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audit and Draft Para Management</td>
</tr>
<tr>
<td>Contracts Management</td>
</tr>
<tr>
<td>Stores Accounting</td>
</tr>
<tr>
<td>Procurement and Tender Management</td>
</tr>
<tr>
<td>Asset Management</td>
</tr>
<tr>
<td>Investigation and Planning</td>
</tr>
<tr>
<td>Construction of Projects</td>
</tr>
<tr>
<td>Mechanical Works</td>
</tr>
<tr>
<td>Dam Safety Monitoring</td>
</tr>
<tr>
<td>Research Activities</td>
</tr>
</tbody>
</table>

### 6.1.2 Software Development Approach

Software development approach for the Package solution and Custom-made software solution has been described here.

#### 6.1.2.1 Package Solution

Package solution will involve the following steps (refer exhibit 6.1):

**a. Project Initiation**

- Understand/ Finalise scope
- Project plan preparation
- Team Build
- Install requisite software

**b. Analysis**
?? User requirement specifications (URS)
?? Process Mapping
?? Gap Analysis
?? Preparation of Customisation Requirements Specifications (CRS)
?? CRS acceptance

c. Customisation

?? Customisation to modify package to suit UPID requirements where required
?? Module and system testing

d. Parameter Set Up

?? Core Set Up
?? Validation

e. Package Interface Development

?? Identify requirement
?? Develop Interface/ Application Program Interface (API) program to suit UPID requirements where required
?? Interface testing

f. Data Migration

?? Identify data requirement
?? Develop data migration program
?? Validation of data
Exhibit 6.1

Package Solution Implementation
6.1.2.2 Custom-made Software Solution

Custom-made software solution may involve the following steps (refer exhibit 6.2):

a. Project Initiation

?? Understand/ Finalise scope
?? Project plan preparation
?? Team Build

b. Analysis

?? Requirements definition
?? User requirement analysis
?? Preparation of URS
?? Preparation of Software Requirements Specifications (SRS)
?? URS and SRS acceptance

c. Design

?? High Level Design (HLD)
?? Low Level Design (LLD)
?? Design Specifications (DS) preparation
?? DS acceptance

d. Construction

?? Coding as per SRS and DS
?? System testing
?? Acceptance testing

e. Data Migration

?? Identify data requirement
?? Develop data migration program
?? Validation of data
6.1.3 Implementation Approach

It is mandatory to have adequate infrastructure ready before procurement of hardware, software and networking equipments. Infrastructure could be in the form of data centres, site for server etc. The details of the tasks to be performed for each
Implementation activity are summarised below (each step, however, may not be required).

?? Hardware Acquisition

?? Software Package & RDBMS Acquisition

?? Preparation for Installation

?? Hardware and Software Package Installation

?? Application Software Implementation
  - Package Application Software Implementation (of enterprise resource planning solution, or any other application package solution)
  - Custom Application Software Implementation (of custom development)
  - Interface Build

6.1.3.1 Preparation for Installation

?? Prepare site for servers and PCs

?? Prepare site for data centre and backup location

?? Complete cabling

6.1.3.2 Hardware Acquisition

?? Select computer configuration

?? Invite bids from hardware vendors (for servers, personal computers (PCs), printers, uninterrupted power supply (UPS), networking equipments etc.)

?? Select hardware vendor and the computer models (for server, PCs, printers, UPS, networking equipments etc.)

?? Place order with hardware vendors

?? Take delivery of servers, PCs, printers, UPS, networking equipments etc.

6.1.3.3 Software Package and Relational Database Management System Acquisition

?? Select application package, operating system (OS), Relational Data Base Management System (RDBMS), Office Automation and Application Tools

?? Place order for the above software packages

?? Receive delivery of software e.g. operating systems, RDBMS etc.
6.1.3.4 Hardware and Software Package Installation

- Install servers (base computer configuration) and PCs
- Install operating system and system software on the servers and PCs
- Install required software on LAN server
- Connect server with PCs
- Establish network connectivity across the entire set up
- Conduct hardware tests
- Augment computer configuration
- Check connectivity of servers with remote locations

6.1.3.5 Application Software Implementation

a. Package Application Software Implementation

The activity wise implementation methodology for the Package application software/Other packages involves following steps (refer exhibit 6.1):

- **Implementation**
  - Prepare environment
  - Package implementation
  - User training
  - Go live

- **Roll out**
  - Roll out plan
  - Local customisation
  - Validation

- **Post Implementation**
  - Support and Maintenance

b. Custom Application Software Implementation

Implementation of custom-made software solution involves the following steps (refer exhibit 6.2):
?? Implementation
- Prepare environment
- Custom software implementation
- User training
- Go live

?? Post Implementation
Support and Maintenance

c. Interface Build

For the combination of package and customised system, an interfacing between the two is essential for an enterprise wide solution. The activities involved in this methodology are given below:

?? Project Initiation
- Project Plan Preparation

?? Analysis and Design
- Requirement Definition
- High Level Design
- Low Level Design
- Design Specification (DS) preparation
- DS Acceptance

?? Construction
- Coding as per SRS and DS

?? Testing and Debugging

?? Implementation

?? System testing for Interface build and Acceptance

As stated above, the application system will be implemented in phases. The application systems in the second priority group could be taken up when implementation of the systems in the first priority group is nearing completion. This is to ensure successful implementation of the application systems in the first priority
group. The schedule of activities has been covered in chapter 7—“MIS Implementation Plan”

### 6.1.4 Quality Management Approach

Software Quality Assurance (QA) is an integral part of all activities carried out for the development, customisation, implementation and maintenance support of software. This section outlines the approach and details of quality assurance that are desired to be followed by the software development, customisation, implementation and maintenance teams for executing the project for UPID. The primary responsibility of quality assurance lies with the project team. A comprehensive quality management plan should be prepared for software development/customisation by application software developer/vendor for UPID and it will act as the main guiding document for all QA related activities.

The approach to quality assurance is through:

- Periodic reviews based on milestones in the project life cycle
- Continuous QA in terms of code inspection, testing and documentation
- Specific request from the project team
- Recommendation from earlier reviews

The quality of a software system is highly influenced by the quality of the process used to develop and maintain it. Software process is a set of activities, methods, practices and transformations that people use to develop and maintain software and the associated products. Exhibit 6.3 shows typical quality life cycle for a software project. All the phases of Software Development Life Cycle (SDLC) are listed right from project initiation to package and release. In each phase all the components should pass through Internal Quality Assurance (IQA) and External Quality Assurance (EQA) process. IQA is the review by the project team and the EQA is the review by the experts external to the project team. The review for the items/deliverables should be conducted at different phases of the software life cycle.
Exhibit 6.3

Quality Cycle

6.1.4.1 Quality Objective

The quality objectives desired for the success of MIS project for UPID are given below:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Quality Factor</th>
<th>Quality Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Functionality</td>
<td>To meet all requirements as would be defined in URS/ SRS</td>
</tr>
<tr>
<td>2.</td>
<td>Reliability</td>
<td>To produce output which is correct and consistent and meets user requirements. To limit the number of defects</td>
</tr>
<tr>
<td>3.</td>
<td>Usability</td>
<td>To give easy to use User Interface to end users</td>
</tr>
<tr>
<td>Sl. No.</td>
<td>Quality Factor</td>
<td>Quality Objective</td>
</tr>
<tr>
<td>--------</td>
<td>---------------------</td>
<td>-----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>users</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Performance</td>
<td>To develop software which accomplishes user’s tasks in reasonable time</td>
</tr>
<tr>
<td>5.</td>
<td>Documentation</td>
<td>To generate documents which are easy to use and understand</td>
</tr>
<tr>
<td>6.</td>
<td>Installation ability</td>
<td>To develop software which requires minimum effort to install</td>
</tr>
<tr>
<td>7.</td>
<td>Maintainability</td>
<td>To develop software which requires minimum maintenance effort and are easy to maintain</td>
</tr>
</tbody>
</table>

It is desired from UPID to monitor the progress of software development, customisation, implementation and maintenance by keeping in mind above mentioned quality objectives.

### 6.1.5 Transition Management

In UPID, as most of the processes are largely manual hence effort on transition management for migration from existing system to new system is mostly on data conversion, data validation and uploading. The new systems would be released for implementation phase by phase. Implementation of the above-mentioned plan would have the following effects:

#### a. Impact on the Existing Operations

Since most of the existing resources will be diverted for the development of the new systems, activities on the existing systems will be restricted to only those that are considered absolutely essential. Impact will be less in UPID as most of the existing processes are largely manually carried out.

#### b. Impact on Productivity

Since the use of packages, new methods and tools for the new development will require extensive training of the IS-IT staff; productivity will be low till they have gained sufficient experience. Though the recommended use of consultants will help overcome most of these problems, the real gains in productivity will only be visible after their familiarity with the new system.
c. Parallel Run of Old and New Systems

Even after a new system has been introduced/developed, there will be a transitional period during which the old and new systems will both have to be run in parallel. Although this transitional period, with some astute planning, can be made quite short, it is still emphasised that users will have to support both the systems with the help of the development team. The transactions from the existing systems would be passed by a conversion program in batches, converted to new system format and then fed to the new system. The validation programs will check the data validity before processing. For the existing computerised system, outputs from both systems will have to be verified manually. In areas where computerised systems do not exist, the outputs from the new system will have to be verified manually till they become stable and reliable.

It is thus likely that the benefits of the new systems will become visible to the users only after a considerable time has elapsed. It is necessary during this phase that top management is firm in its own commitment and also ensures the continued support and understanding of the users to the plan during this transition period. The important considerations for transition management are as follows:

- Historical data will have to be converted to match the format of the new system to facilitate comparison of figures.
- The data of technical and executive functions, needed to run the application system will have to be in the format as required by the proposed system.
- Collaborative tools should be used to keep documents or records of various files.

6.1.5.1 Transition Management Team

Uttar Pradesh irrigation Department should form a Transition Management team (TMT) in order to make sure that all the IT related change initiatives underlying the restructured process fit together. TMT should ideally consist of senior officials of UPID drawn from various user groups across the department and who are committed to making the transition a reality. TMT manages the operational issues of the change effort. In addition, it needs to anticipate and manage the reactions, questions and concerns that information technology related change generates.

6.1.5.2 User Impact and Preparedness

The impact of implementing the Information Systems Plan will be felt by UPID as a whole and specified by the end users, for whom it will mean an end to their routine chores. But to reap the maximum benefits from the information systems, the users will have to be adequately trained in the skills that the information systems demand.

6.1.6 Change Management Approach

Change management (CM) is critical need for UPID as department is moving to embrace MIS. Change is inevitable and omnipresent hence UPID management must gear the department to the pace of change necessary for adaptation and select a
growth posture that will be successful and satisfying to UPID. For this UPID has to start effective change management from the initial phase so that employees will be ready to adapt change. If change management is not suitably propagated, it will have serious consequences on MIS implementation.

Approach to change management is to adopt change management techniques by propagating change through change agents. By capturing lessons learned through change management, UPID gains the means to thrive in the face of constant change. Change agents are provided with the training and expertise and they need to propagate successful change, and to learn time-efficient techniques to quickly accomplish project goals. Potential resistance sources are gathered and assessed. The work continues with implementing the change. Developing a communication system ensures that each employee involved in the change understands each element from their point of view. The learning system is designed to provide the right training for the right people at the right time.

The change management strategy has been detailed in the section 6.2 of this chapter.

6.1.7 Hindi User Interface Approach

UPID at large can benefit from the Information Technology (IT) effectively if employee can communicate with computers in their own language, Hindi. Most of UPID’s current documents are Hindi based so it would be advantageous to have Hindi User Interface (UI) with the applications software. This calls for bilingual computing solution of application software. Monolingual and Bilingual fonts are described as follows:

a. Monolingual

A monolingual font is one, which has shapes only for one script. This facilitates the font to have more number of various shapes used in that script and it is therefore possible to show many conjuncts and complex shapes used in the script. Common examples of monolingual fonts are Amar, Chandni and the likes.

b. Bilingual

A bilingual font is one, which has shapes for English and any one Indian script. This however, limits the font to have lesser number of shapes used in that script as a lot of code values are used to have images of the English script. A bilingual font therefore does not have information about certain complex and rarely used conjuncts. This is a compromise due to limitation of the number of glyphs (shapes) that can be stored in one font file.
6.1.7.1 Standardisation of Fonts for Indian Scripts

A font is a file carrying information about glyphs corresponding to a code value which when appears on a viewer with the font selected, renders and shows the corresponding glyph on the screen for viewing.

The absence of standards for Indian scripts has been the basic cause of problems for incompatibility across documents and information using different scripts based on different standards or in most cases no standards. In order to standardise the usage of Indian Scripts on computers, the Department of Electronics (DoE) has defined the character set and keyboard layout for Indian scripts. The standard number IS13194:1991 issued by Bureau of Indian Standards (BIS) is the latest Indian standard for information interchange, and is being widely used for development of IT products in Indian language. It is desired from Hindi User Interface to comply with the prescribed standards.

Along with the character-encoding scheme (Indian Standard Code for Information Interchange, ISCII), the Govt. of India also defined a keyboard layout for input called INSCRIPT. The research and development wing of the DoE, Govt. of India has developed software packages based on these Indian standards. Indian Script Font Code (ISFOC) standards have been evolved towards removing the 'incompatible font' scenario prevalent now. ISFOC standards provisions can enable selection of a wide variety of fonts to meet varying requirements.

The INSCRIPT overlay contains characters required for all the Indian scripts, as defined by the ISCII character set. The Indian script alphabet has a logical structure derived from the phonetic properties. The INSCRIPT overlay mirrors this logical structure. This overlay fits on any existing English keyboard. Alternating between the English and INSCRIPT overlay is achieved through the Caps Lock key. The INSCRIPT keyboard provides a logical and intuitive arrangement of vowels and consonants. It is based both on the phonetic properties and the relative usage frequencies of the letters. Not only does this make the keyboard much easier to learn, but also enables a person to type subsequently in all the Indian scripts.

ISFOC Script Manager (ISM) 2000 is a script/keyboard manager developed by an organisation of the Ministry of IT in India. It enables the user to make entries of text in various Indian Scripts within various applications. Hence it provides for proper viewing, editing and printing of Indian scripts in applications that have provisions of setting these fonts. Existing graphics oriented environments can be enabled to facilitate the usage of any Indian script, through the ISM. The ISM 2000 Keyboard Manager allows the user to select one of the following keyboard overlays:

1. Phonetic English
   This keyboard overlay, has the Indian script alphabets phonetically assigned to that of English alphabets on the PC QWERTY overlay.

2. Type Writer
Typewriter keyboard overlay can be selected for the current script. This facility mimics the manual typewriter keying in sequence. This has been provided to facilitate the usage of computer for new users who are regular manual typewriter operators.

6.1.7.2 Hindi User Interface for Mailing & Messaging

a. Character set and Locale support

Error free character set handling or character set conversion between platforms and/ or applications is at the heart of running a multilingual environment. Over time, many different character sets have been developed that support different language groups on different hardware platforms. This means that for every character in every language, software must effortlessly and correctly handle every character set conversion across applications and platforms.

In an attempt to solve the problem of proliferating and mutually exclusive code pages, members of the high tech community came together to form the Unicode Consortium with the goal of providing "a unique number for every character, no matter what the platform, no matter what the program, no matter what the language." Unicode™ does this with a single code page, in lieu of what exists in hundreds of code pages to this day. Software must support Unicode.

The Unicode standard encompasses most alphabetic, ideographic, and symbolic characters used on computers today. Using this one codeset enables applications to support text from multiple scripts in the same documents without elaborate marking of text runs. At the same time, applications need to treat Unicode as just another codeset - that is, apply the principle of codeset independence to Unicode as well.

b. User Interface Options

The important points to know about running any software in a global environment are as follows:

?? Software should share a single, worldwide code base (Unicode) for all languages assuring the same high quality and 100 percent compatibility for all language versions.

?? Software should be able to seamlessly manipulate character set data across any of the languages supported by them.

The software should be available in national language versions (NLV) and national language support (NLS). NLVs provide underlying character set and locale support as well as a translated user interface, translated templates, and translated user assistance components. Refer to exhibit 6.4
NLS allows to store, process, and retrieve data in native languages. It allows for data to be stored and presented in culturally appropriate time, date, calendar, monetary, and numeric formats that are essential for everyday use. And it ensures that database utilities and error messages are presented to the user in the appropriate native language. National Language Support is a key enabler and a fundamental building block for creating the infrastructure needed to readily share and access data.

Multilingual organisations typically choose Global English servers with translated templates and User Assistance Language Packs. This allows them the flexibility of presenting end users with critical information in their own language. A User Assistance Language Pack provides translated application templates as well as translated online, server-based help and translated web resources.

**Conclusion:**

It is recommended to go for the global English version of messaging application software that supports Unicode standards and install fonts like Amar, Agra, and Chandni etc in the Desktop clients of the mailing users for sending an email in Hindi language. However, in this case the To, cc, bcc and Subject fields of the email memo will be in English language. Only the body of the email will be in Hindi language. Whenever, the sender requires sending an email in Hindi Language, he/ she has to
switch the font type to Amar, Agra, and Chandni etc. The receiver of the email also should have the proper fonts installed in its Desktop client to view the email. It is suggested that fonts selected shall also follow prescribed standards and comply with government order.

6.1.7.3 Hindi User Interface for Information Systems

The user interface of any information system consists of the following components – input screens, error messages and output reports.

The labels of the input screens are static and the language in which it is to be displayed to the end user should be decided at the time of design. The fields in which the data entry is done can be monolingual (only one language - English or Hindi) or bilingual (both English and Hindi) depending on the design of the application system and the usage of tools that facilitate multiple languages. Without the usage of tools the data entry in the fields can be done in only one language either English or Hindi that is pre-specified at the time of design. However, if tools are used then bilingual text entry can be done which means that users can enter the data in both English and Hindi in the same field. This data will be displayed to the user in the language and format in which it was entered. A screen shot showing bilingual text entry can be referred from exhibit 6.5

Exhibit 6.5

Bilingual Text Entry
The language of the error messages that are displayed to the user needs to be pre-specified at the time of design. It can be only one language – either English or Hindi.

The output reports will be designed in word processor or report generation tools. The report formats and the labels will be designed and stored as pre-printed stationery or templates, which can be monolingual or bilingual depending on the need. However, this has to be decided at the design stage itself. The fields in these templates will be populated from the database and the language of the data that is printed will be that of the language in which the data was entered in the input screen.

6.1.8 MIS Training Approach

Training is a process of imparting necessary knowledge, developing skills and changing attitudes of employees to enrich their existing knowledge, skills and attitudes, and develop new ones. Training courses and programmes are conducted to meet the needs of all professionals in UPID—both at the entry stage and on a continuing basis.

6.1.8.1 Training Objectives

The efficiency of any organisation depends directly on how well its members are trained. Newly recruited employees usually need some training before they can take up their work; older employees require training to remain up-to-date to cope with the demands of their present jobs. Training also motivates employees to try and work harder. They are able to see a closer relationship between their effort and performance. Further, the very fact that the management is investing resources on an employees’ training provides a reassurance that one is a valued employee. Effective managers require training as an on-going, continuous process, not as a one-off activity. New problems, new procedures and equipments, new knowledge and new jobs constantly create the need for employees’ training and development.

The objectives of training for UPID can be summarised as follows:

?? To avoid obsolescence and facilitate continuous up-gradation of knowledge, skills, and attitudes, thereby improving organisational performance.

?? To improve the potential of an individual so as to enable one to occupy a superior position, thereby providing career progression and improving employee motivation.

6.1.8.2 Training Procedures

It is important that training needs should be carefully and systematically identified. Areas where training could bring about tangible and lasting benefits to UPID must be defined in clear and unambiguous terms. Training needs for employees are identified through a combination of the following:
a. Organisation analysis:

Training needs must be looked at against the backdrop of departmental goals and strategies to ensure that they advance the cause of the department. This calls for a comprehensive analysis of the department culture and the decision-making process against the benchmark of departmental objectives. It calls for an understanding of the deficiencies, drawbacks, and weaknesses in the current mechanisms and systems, which would have to be altered for synchronisation with the department’s mission and objectives.

At present most of the processes in UPID are being carried out manually. UPID is heading towards fully automated system; hence an extensive training on computer and management information systems is required.

b. Person analysis:

It is very important for diagnosing the training needs, especially in functional areas. The employee performance forms the basis for this analysis. This analysis will also highlight the current skill profile of the relevant employee.

As most of the processes in UPID at present are largely manual; hence it is not possible to judge the employee performance with respect to use of information technology.

c. Task analysis:

Task analysis includes setting basic norms, targets and standards, which the employees are expected to attain. By correlating the task analysis with the output of person analysis, the training department identifies skill gaps, which have to be resolved through training. So far as skill training at the operational level is concerned, it should be imparted both on-the-job and through short training workshops.

The competence and training needs are identified on regular basis drawing the inputs from management and the individuals. UPID’s personnel will be required to undergo training for the successful implementation of the proposed MIS.

6.1.8.3 Training Approach

The following alternative approaches to training may be considered by UPID:

I. Nominating personnel to training programmes conducted by various institutions/ organisations. Training the entire staff by this method can be very expensive for UPID but this method has the advantage of having the staffs concentrate on the training programme being free from daily responsibilities.

II. Having a professional organisation to conduct training programs in house so that maximum number of people could be trained at a reasonable cost.
6.1.8.4 Organising Training

The training programme should lay stress on participants’ interaction, which is active involvement in discussion and presentations, reviews and exercises etc. Training should be judicious mix of classroom lectures and hands on sessions. Continuous performance evaluations should be there through quizzes and assignments. It is recommended to create a training group responsible for all training related activities for employees of UPID.

a. Identification of modes of training

Training group will decide to adopt one or more of the following.

?? Adjust specific requests in an already scheduled programme to be conducted by UPID

?? Organise additional programmes to be conducted by UPID

?? Organise self directed study using one or more of the following available facilities
   - Computer based training (CBT)
   - Video based training
   - Reading material
   - Guidance from subject experts
   - Any other methodologies (e.g. Internet)

?? Avail training services of external organisation

b. Co-ordination for training programme

Training group will maintain a database of all employees and faculties and will update the same against trainings conducted. The various activities to be conducted are as follows

?? Brief faculty about the profile of the participants and objective of the programme

?? Co-ordinate for venue and training related resources

?? Inform the participants about the venue, timing and dates in advance

?? Plan training such that working of UPID is not suffered owing to participants’ unavailability because of external training

?? Arrange repeat training for employees, if required

?? Maintain attendance of participants
?? Keep a record of participants’ performance in the course

?? Keep a record of participants not attending the programme

?? Collect completed feedback form from participants

?? Collect completed feedback form from faculty

c. Evaluation of performance and feedback

Training group will carry out the following evaluation activity

?? Faculty will evaluate participants’ performance during the training session and will give feedback to the Training group

?? Participants’ feedback about the faculty will be communicated to the Training group. Training coordinator will summarise each factor in the training feedback form and generate course summary report.

6.1.8.5 Training Requirement Classification for UPID

Depending upon the skills of the personnel (deputed, existing or recruited), task analysis, person analysis and organisation analysis the training requirements have been determined for UPID to implement, support and maintain the proposed application systems. The training would cover the following depending on the individual’s work assignment and needs:
### a. Systems personnel of Information System Department (ISD)

<table>
<thead>
<tr>
<th>ISD Role</th>
<th>Training Needs</th>
</tr>
</thead>
</table>
| **Application System Support Group** | ?? Installation  
|                                  | ?? Parameter tuning  
|                                  | ?? Application design, logic and usage  
|                                  | ?? Coding  
|                                  | ?? Configuration management  
|                                  | ?? Performance tuning of applications  
|                                  | ?? Client server architecture  
|                                  | ?? Structured systems development methodology  |
| **Database Administration Group** | ?? Database installation  
|                                  | ?? Security maintenance  
|                                  | ?? Parameter tuning  
|                                  | ?? Creating and maintaining the database objects  
|                                  | ?? Performance Tuning  
|                                  | ?? Database design  
|                                  | ?? Back-up/ recovery/ restart procedures  
|                                  | ?? System start-up and shutdown procedures  
|                                  | ?? Client/ Server Architecture  
|                                  | ?? Database Administration  |
| **Network Management Group**     | ?? Data Communications and Network management  
|                                  | ?? Performance tuning and monitoring of network  
|                                  | ?? Network design  
|                                  | ?? Security maintenance  
|                                  | ?? Components of Network e.g. routers, switches etc.  
|                                  | ?? Network management software  |
| **Operations and Facilities Management Group** | ?? Servers, Desktops and Peripherals management  
|                                  | ?? System Administration  
|                                  | ?? Backup and Recovery management  
|                                  | ?? Security maintenance  
|                                  | ?? Installation of software and hardware  |
| **Mail and Messaging**           | ?? System Administration of mail and messaging software  
|                                  | ?? System start-up and shutdown procedures  
|                                  | ?? Back-up/ recovery/ restart procedures  
|                                  | ?? Mail and messaging software installation  
|                                  | ?? Security maintenance  
|                                  | ?? User Management  
<p>|                                  | ?? Performance Tuning  |</p>
<table>
<thead>
<tr>
<th>ISD Role</th>
<th>Training Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GIS and CAD group</strong></td>
<td>?? Fundamentals of GIS/CAD</td>
</tr>
<tr>
<td></td>
<td>?? Analysis on GIS/CAD</td>
</tr>
<tr>
<td></td>
<td>?? Management of data (Such as digitisation,</td>
</tr>
<tr>
<td></td>
<td>preparation of maps, drawings etc.)</td>
</tr>
<tr>
<td></td>
<td>?? Topologies and Queries etc.</td>
</tr>
</tbody>
</table>

The entire above-mentioned group also needs to undergo the training on:

?? Help Desk
?? Troubleshooting
?? Quality management systems
?? Computer fundamentals
?? Intranet, Internet and Mail and Messaging usage

b. End-users

The training needs of the user have to be addressed at two levels. The first level would be on awareness on computers and advantages of information technology. The second level would involve formal training in the use of installed computer systems for their respective functions. The training would cover the following areas:

?? Fundamentals of computers, peripherals, operating systems and word processing tools e.g. UPS, Printers, Word, Excel, and Power Point etc.
?? Internet, Intranet & Office Messaging e.g. Lotus Notes
?? Use of office automation tools
?? Defect logging systems
?? Application software

c. Management Personnel

The training of management personnel/senior officials of UPID should address the following areas apart from the End user trainings:

?? Query generation
?? MIS report analysis
?? Change management
?? Risk management
?? Defect prevention

?? Quality management system

?? Geographic information systems (GIS)

?? Decision support systems

d. Helpdesk

?? Application software

?? Internet, Intranet & Office Messaging

?? Defect logging systems

?? Defect tracking and resolution

?? Call management procedures

?? Effective communication

?? Trouble shooting training

6.1.8.6 Training Impact Assessment

The training programmes play an important part in the smooth and effective functioning of the organisation. The impact of such programmes on the functioning of UPID must also be assessed periodically. The responsibility for such assessment shall be with UPID. The period of assessment could be from one month to one year after the programme has been conducted. Based on the assessments, UPID may decide to discontinue/modify a particular programme or change the faculty members.

Conclusion:

It is recommended that UPID outsource the above-mentioned training to reputed and experienced organisations. Finalisation of detailed MIS training curriculum, evaluation and standardisation of computer training programs available from various professional organisations and identification of training institutions capable of taking up such tasks shall be done in phase 1 for development of a complete training plan of MIS. To keep abreast of the latest technology, a continuing education program should be adopted, wherein the staff is deputed periodically to attend external training programs. To derive the maximum mileage from such programs every person nominated to an external training program may be, in turn, required to conduct internal training for other members of UPID. Further it is recommended to build in the training component into the procurement of hardware and software.
6.1.9 Risk Management

Implementation of MIS in UPID has a number of risks associated with it. Risk is viewed as uncertainty in the project outcome. The risk factors can have an adverse impact on the successful implementation of MIS. This adverse impact may be in the form of cost escalation, or delayed achievement of significant benefits. These risks need to be carefully managed to ensure that the implementation is completed in the specified timeframe and within budget, and the expected benefits are realised. Risk management has two significant steps:

?? **Risk Assessment** – involves identification of risk factors and analysis

?? **Risk Control** – involves risk reduction planning and monitoring

This section sets out the key risks and the corresponding control mechanisms.

6.1.9.1 Risk Drivers and Factors

A project can be classified to have high risk because it may not:

?? Be completed within its budget

?? Be completed by due date

?? Provide quality product

?? Be easy to maintain and support

These four major ‘drivers’ are referred to as cost, schedule, quality and performance, and maintenance and support. Each of these drivers is associated with several contributing factors.

The various risks, after consideration of specific needs of UPID have been identified. For each risk, the major drivers and mechanisms to control them are given below:

a. Lack of long term commitment to the strategy from the department as a whole and especially top management

*Drivers*

?? Absence of a person with adequate systems knowledge at a sufficiently senior level to drive the strategy and assist management in taking key decisions

?? Unrealistic expectations of ‘instant’ results and short implementation timeframes

*Control Mechanisms*
Monitoring by a person at a senior management level to drive the strategy and to ensure that implementation progresses as planned and issues are resolved promptly

Preparing realistic project schedules

Constituting Steering Committee to monitor progress of the implementation

b. Resistance to change

Drivers

Fear of uncertainty, unknown and possible failure

Prior change may have been unfavourable

Change might threaten job security, job knowledge and status

Change might not protect vested interest

Control Mechanisms

Awareness about benefits of changes to UPID

An effective change management for smooth transition from largely manual process to a highly structured information systems based procedures and processes

Proper skill up-gradation and training of employees to accommodate change

c. Lack of adequate user involvement to provide appropriate inputs on a timely basis for implementation of information system

Drivers

Very high demand on user time. Users would need to spend a large amount of time during the development of application systems

Pressures from day to day work

A communication gap between users and system personnel e.g., use of terms, roles and expectations on both sides, and a lack of understanding of the system development processes

Control Mechanisms

User training in the systems development processes and their role in systems development

Inclusion of IT related issues in the objectives of the concerned personnel

Preparation of realistic estimates of the effort required for the users for system development, which would be in addition to their day to day work
? Involvement of the head of user departments in planning/management of the projects

? Relieving users for their day to day work

d. **Non-availability of adequate internal system skills**

*Drivers*

?? Large scale of operations of information system function

?? Rapid introduction of new application systems and technologies, with which users are relatively unfamiliar

?? Limited functional expertise and skills in the areas of software development which are critical in the development of application systems

*Control Mechanisms*

?? Recruitment of computer literate professionals

?? Use of a well structured systems development methodology

?? Adequate training of personnel

e. **Non-availability of external system personnel**

*Drivers*

?? Requirement of a considerable number of external systems professional

*Control Mechanisms*

?? Obtaining these personnel from high quality, well established and stable organisations, which can ensure the availability of an adequate number of professionals and guarantee replacements for personnel who may leave

?? Limiting the reliance on individuals through the use of a robust and well structured systems development methodology

f. **Inadequate package vendor support**

*Drivers*

?? Package vendor does not provide timely support

?? Unavailability of adequate local support facility for the package
Control Mechanisms

?? Provision of adequate training to UPID’s systems personnel, thus enabling support from within

?? Involving high quality external consultants in the hardware installation and package implementation processes

?? Ensuring that the vendors for hardware and selected packages have appropriate local support facility

g. Inadequate hardware vendor support at remote sites

Drivers

?? Lack of timely support by the vendor at remote locations

Control Mechanisms

?? Provision of adequate training to UPID’s systems personnel on basic systems maintenance and trouble shooting, thus enabling support from within

?? Ensuring that the hardware vendor selected has local support facility

h. Lack of preparedness of communication networks in time for implementation of executive and technical functions

Drivers

?? Delay in site preparation

?? Delay in installation of servers and networking equipments

?? Delay in establishing network connectivity

Control Mechanisms

?? Timely availability of site and networking equipments

?? Involvement of the head of user departments in making required network available

?? Involving high quality external consultants in network connectivity processes

?? Provision of adequate training to UPID’s systems personnel on basic network maintenance and trouble shooting

?? Maintaining some spare on site, thus enabling support from within
i. **Obsolescence of Hardware / Software**

**Drivers**

?? Rapid change in technology could render hardware obsolete

?? Rapid changes in technology and changes in laws and regulations causes application software become prematurely obsolete

**Control Mechanisms**

?? Selecting an established hardware vendor with a significant installed base, and a commitment to support and upgrade its hardware and provide smooth migration paths to future generations of hardware

?? Ensuring that the vendor for the selected package, upgrades the package to incorporate any changes in business laws or regulations and the same will be available to the department

?? Upgrade the custom made software to incorporate any changes in the procedure, laws or regulations with the help of system personnel or external consultants

j. **Schedule and Budget Overruns**

**Drivers**

?? Short implementation timeframes/unrealistic schedules

?? Contingencies not in keeping with the scale of the project

?? Non-availability of adequate technical and user documentation for the selected package

?? Unstructured systems development approach

**Control Mechanisms**

?? Preparation of realistic budgets and schedules

?? Provision of a contingency for budget overruns

?? Use of a robust and structured development methodology along with an established project management approach, to enable the identification of potential schedule and budget overruns early on and the prompt initiation of corrective action.

k. **Lack of availability of data in specified format and in time for implementation of information system**
Drivers

- Very high demand on user time. Users would need to spend a large amount of time during the data conversion and loading for application systems
- Inadequate standard for data format

Control Mechanisms

- Timely availability of electronic data in the specified format
- Priority to data loading related issues
- Involvement of the head of user departments in making required data available

1. The projected benefits may not be realised to the extent possible or may be delayed

Drivers

- Lack of continuous monitoring of project implementation
- Inadequate user involvement/training
- Inertia of users in switching over to the new environment

Control Mechanisms

- Ensuring adequate user involvement on an on-going basis in each of the development projects
- Providing thorough application systems and IT training to the users
- A well-designed process may not automatically and easily be acceptable to the users; thus sufficient time must be allowed for the change to be accomplished

m. Not following proper implementation sequence, as mentioned in implementation plan, dwindles MIS benefit

Drivers

- Delay in acquisition or installation of software, hardware, networking and other necessary equipments required for MIS project
- Not adhering to implementation schedule identified in implementation plan

Control Mechanisms

- Timely acquisition and installation
Monitoring by the management to ensure proper adherence to implementation schedule

It is recommended that UPID reassess the risks and evolve a mechanism to contain the risk on an on-going basis.

6.2 Change Management

Change is part of environment of every organisation. There is no alternative to change. All the major functions of an organisation like planning, organising, staffing, directing, controlling and representing are change processes. Planning especially fits this definition since the goal of planning is to take an organisation from its current state to some future desired state. The general theme is that organisation adapt as a response to stimuli both from the environment and from within. Environmental factors especially force change on organisations, and it is management’s responsibility to convert these signals into action. Change is inevitable and omnipresent hence UPID management must gear the department to the pace of change necessary for adaptation and select a growth posture that will be successful and satisfying to the UPID. So most accurate representations of a manager in this environment is that of a change agent.

The most obvious definition of “change management” is that the term refers to the task of managing change. Managing change refers to introducing changes in a planned and managed or systematic fashion. The aim is to more effectively implement new methods and systems in UPID. The changes to be managed lie within and are controlled by the department. However, these internal changes may be triggered by events that have originated outside the department, in what is usually termed “the environment.” Hence, meaning of managing change, is the response to changes over which the department exercises little or no control (e.g., legislation, social and political upheaval, the actions of stakeholders, shifting economic tides and currents, and so on).

UPID is one of the oldest and largest government departments in India. UPID has very large employee strength and most of the employees have been with the organisation for a very long time. There are different categories of posts involving different job characteristics and at present the processes in UPID are largely manual. A smooth transition from largely manual process to Management Information System based process is to be done. It is very difficult to change the practices and culture of such a large, old department with varied job characteristics at all levels. Hence the need for change management was felt for a smooth transition. The most important component for UPID is human capital. And, since people react differently to changes in the working environment, it is very difficult to predict individuals’ reaction to change, especially when a new technology is being implemented or embraced by the department. When it comes to embracing new technology initiative, employees can be classified under the following categories, based on which they can be handled:

a. Enthusiasts
Such employees show a good deal of enthusiasm when it comes to experimenting. They are willing to innovate, even if it means extra work or taking some risks. Enthusiasts are characterised by cooperative nature and possess an open mind. People in this category are few in numbers and may be scattered in different functional areas of the department. It is possible that such enthusiasts are already technology savvy. Many may be desirous of enhancing their positions within the department and looking for further progress in their respective functional areas. Enthusiasts can certainly bring in the much-required support for the department in implementing the information technology initiative. Such employees not only work hard and contribute directly in implementation but also influence other employees.

b. Followers

These are employees who would rather take the “wait and watch” approach. They will have their reservations in the initial stages but will observe the enthusiasts and depending on the results produced, they would take the initiative. Once the enthusiasts have experimented and achieved some success, the followers would buy in the concept. They would then be willing to embrace the change without reservations. Typically, majority of the people in UPID fall under this category.

c. Resistors

People falling under this category carry pre-prejudices even when enthusiasts have achieved certain degree of success and the majority of followers have embraced the change. They would continue to have their reservations about new technologies and thus, would continue to resist change.

The expectation from management of UPID is to identify and include the enthusiasts in the “Core Team” or the “Task Force” for Change Management. The challenge, therefore, lies in identifying the enthusiasts and getting them interested in the change initiative. The enthusiasts can be included in implementation and subsequent rollouts, and can act as instructors during internal training programs, besides acting as interaction coordinators with external agencies. It is recommended that core team of enthusiasts shall be led by Engineer In Chief and comprise of chief engineer, superintending engineer, executive engineer, assistant engineer and junior engineer of UPID.

For effectively managing change and spreading it across the UPID, skill up-gradation of existing employees is required. To reap the maximum benefits from the proposed MIS, the users will have to be adequately trained in the skills that the MIS demands as per their needs. Skill up-gradation for existing employees and training needs for employees have been dealt in section 6.1.8-“MIS training approach.”

6.2.1 Why Change is resisted

The resistance to change is largely a function of expectations. If we expect to benefit from the change, we will favour it. If we expect to lose, we will resist it. It is a common misconception that people resist all kind of changes. Most people are reasonably comfortable with their current existence. Experience in current
surroundings gives one a feeling of control and certainty. Potential change represents a threat to these forms of need satisfaction. The benefits of change must be clearly laid out and weighed against the potential losses. Unless the perceived pluses exceed the minuses, procrastination may hinder successful implementation. Force-Field Analysis examines the dominant situational forces that control the direction of change. Exhibit 6.6 shows the force field analysis for the UPID. The two primary forces represent management and employees of UPID.

Exhibit 6.6

Force Field Analysis

Forces affecting the direction of Change

<table>
<thead>
<tr>
<th>Factors Favouring Change</th>
<th>Factors Resisting Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved efficiency</td>
<td>Fear of unknown and possible failure</td>
</tr>
<tr>
<td>Increased revenue for the department</td>
<td>Prior changes may have been unfavourable</td>
</tr>
<tr>
<td>More control and predictability</td>
<td>Protect vested interest and current power structure</td>
</tr>
<tr>
<td>Implement technological advances</td>
<td>May destroy current interpersonal relationship</td>
</tr>
<tr>
<td>Assist taking informed decisions</td>
<td>Change is contrary to existing procedures, policies and practices</td>
</tr>
<tr>
<td>Improved institutional capacity</td>
<td>Large, bureaucratic structures</td>
</tr>
<tr>
<td>Improved sustainability</td>
<td>Change threatens job security, job knowledge and status</td>
</tr>
</tbody>
</table>

Equilibrium

Most of the factors on the left side are of benefit to management. Management has taken a decision to automate the working of UPID by development of Management Information System as a means of gaining efficiency over processes, obtaining more control and predictability, implementing technological advances, improving institutional capacity, improved sustainability, pursuing opportunities and taking informed decisions.

On the other hand, automation sends strong danger signals to the current work force. It creates uncertainty and unknowns that are highly threatening. Restructuring work groups always results in some immediate loss of social need satisfaction because current interpersonal relationships are modified or destroyed. Furthermore conflicts arise over vested interests, and restructuring may undermine the current power structure. If employees expect to experience a net reduction in need satisfaction (insecurity, uncertainty, loss of status versus vague potential gains), only the highest
degree of confidence in management can save the day. It must be understood that change will represent a win/win situation.

6.2.2 Organisation Development

Organisational Development (OD) uses knowledge and technique from the behavioural sciences to increase organisational effectiveness. The aim is to encourage cooperation, eliminate conflict, increase motivation, improve problem solving, open communication, and develop mutual trust. The ultimate goal is to introduce planned, systematic change into the department. Members of core team of enthusiasts shall practice OD techniques in their respective work units. They will propagate change management principles across UPID. The common techniques for OD applicable for UPID are as follows:

a. Interviews

This is a diagnostic step, where the members of core team shall attempt to gain a deeper understanding of the department and its problems by interviewing employees.

b. Questionnaire surveys

This is another fact-finding or diagnostic step. Employees are surveyed for their opinions on job-related issues. It is a valuable tool, since people will often reveal views in an anonymous survey that they are unwilling to express in conversation.

c. Group-discussion sessions

These sessions are used for both diagnostic and problem-solving purposes. Initially the members of core team attempt to get the group to identify problems in the department, either by open discussion or having individual or small groups list the factors that prevent the department from being more successful.

d. Team Building

A major goal of OD is to improve collaboration. To achieve this, team building sessions are conducted, that focus on the operations of one group. The goal is to get the employees to strengthen their common identity. As in the group discussion session, employees are encouraged to think of problems or difficulties that prevent cooperation and to explore methods for improving the quality of relationships.

e. Inter group Relations

Inter group OD techniques are similar to team building, except several groups meet instead of just one. The goal is same (identifying problems and methods for overcoming them), but the focus is on inter group rather than intra group relations. Each group lists the strengths and weaknesses of other groups. These lists would then
become the basis for identifying problems and reaching solutions. Or, using the organisational mirror approach, one group sits in the centre while the others critique it. The focal group is not permitted to engage in the discussions, and each group has its turn in the centre.

f. Process Interventions

These are directed at improving processes like decision-making, planning, communication, or others involved in the functioning of the department. The scope is more narrow and directive than the procedures discussed above.

g. Comprehensive Systems Approach

Most of the above techniques are fairly narrow in scope. One of the best techniques is “Grid Organisational Development”. It involves series of sessions with one organisation that extends over a long period. The first session focuses on micro unit - the individual. The goal is to increase management and job knowledge and to improve interpersonal skills, especially in developing clear communications, trust and openness. This is followed by team building exercises within a group. From this they advance to sessions aimed at improving intergroup relations. Then the entire department is analysed, including its corporate strategy, and the group builds an ideal strategic corporate model. Finally the organisation looks back to evaluate how it is doing and to see if any corrective action is needed.

6.2.3 Change Source

The relationship between planning and change is complex. In some instances change is so rapid, abrupt or unknown that planned responses or proactive stances are essentially impossible to develop. Change can be anticipated, permitting responses to be planned. Change can also be deliberately generated through the actions of management. The degree, to which change can be planned, is a function of two primary factors - whether the change source is internal or external to the department and whether management controls the source.

Strategic plans can be accurately projected over a longer time period and beneficially developed in greater detail with more certainty. Certainty comes from being able to predict environmental change and/ or through greater capacity to control future outcomes. When change involves factors internal to the firm, the process is much more controllable as is the case with UPID. Department can modify its operational goals, redesign jobs, reassign personnel, obtain different materials, or take a host of other action to alter the current situation. All factors are not totally controllable (union contracts, employee commitment, or informal work norms), but the degree of control is generally far greater over internal resources than over external factors. UPID is a department where the changes in the government have its impact on the priorities of the department. Government can be perceived as internal to the department but ID does not have any control over it. All policy matters are finalised in consultation and in agreement with Government.
6.2.4 Basic Change Models

Change can be viewed from at least four perspectives:

1. External change that is beyond the control of management and the department is forced to adapt (for example: advance of computer technology, population increases, flood, drought and government regulations etc.)

2. External change that is influenced by the department (for example: Increase in the revenue rate for irrigation land)

3. Internal change initiated by management (for example: reassigning personnel, modifying the organisation design, redefining hierarchy, moving to an automated system from manual process)

4. Internal change initiated by internal forces other than management (for example: informal work group norms, strike)

Effect of change on department is shown in exhibit 6.7.

Exhibit 6.7

Environmentally induced changes

Management induced changes rarely occur without resistance. Hence main concern is recognising the obstacles to change and how to overcome them. For UPID the management has initiated the change and hence falls under third change management model as mentioned above. Any balanced approach involves alternatives relating to the key factors governing department: people, tasks, goals, technology, and organisation structure and processes (refer Table 6.3). The need for planned internal change results from one of the following three situations.

?? A problem that needs to be overcome,

?? A necessity to adapt to externally forced change,

?? The commitment to achieve a new goal or pursue an opportunity.

Table 6.3
### Management Variable and Change Methods

<table>
<thead>
<tr>
<th>Management Variable</th>
<th>Change Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose and goals</td>
<td>Modify existing objectives and goals</td>
</tr>
<tr>
<td></td>
<td>Use management by objective programme</td>
</tr>
<tr>
<td>Tasks</td>
<td>Adjust the difficulty level of tasks</td>
</tr>
<tr>
<td></td>
<td>Adjust the variability of tasks</td>
</tr>
<tr>
<td></td>
<td>Use job enrichment programs</td>
</tr>
<tr>
<td>Technology</td>
<td>Improve machinery</td>
</tr>
<tr>
<td></td>
<td>Improve materials</td>
</tr>
<tr>
<td></td>
<td>Improve methods and operations</td>
</tr>
<tr>
<td></td>
<td>Change selection policies and practices</td>
</tr>
<tr>
<td>People</td>
<td>Use on the job training program</td>
</tr>
<tr>
<td></td>
<td>Use management development programs</td>
</tr>
<tr>
<td></td>
<td>Clarify roles and responsibilities</td>
</tr>
<tr>
<td>MIS Organisation structure and processes</td>
<td>Create job descriptions</td>
</tr>
<tr>
<td></td>
<td>Transfer functions and responsibilities</td>
</tr>
<tr>
<td></td>
<td>Create reporting structure</td>
</tr>
<tr>
<td></td>
<td>Revise policies and procedures</td>
</tr>
<tr>
<td></td>
<td>Change the organisation climate</td>
</tr>
<tr>
<td></td>
<td>Use team building, and other Organisation development techniques</td>
</tr>
<tr>
<td></td>
<td>Modify controls, information systems, etc.</td>
</tr>
</tbody>
</table>

#### 6.2.4.1 Organisation objectives and change process

The change management discipline gives managers control of the Information Technology (IT) service priorities. It provides the procedures to safeguard existing services and safely introduce new services. The procedures will increase service availability and IT efficiency by reducing the number of unnecessary changes and ensure that no service issues are caused by application or infrastructure changes. Most
successful change projects accomplish their objectives via project teams. The change disciplines are a set of processes for coordination, authorisation, and communication required to ensure the right people know about and approve a change to the IT infrastructure or services. All staff in UPID needs to understand the change process and their role and responsibilities within this process. Management by Objective (MBO) is a method whereby a supervisor and subordinate jointly set job goals for the latter. It is hailed as a way to clarify a person’s role in the department, establish performance criteria, increase motivation, and improve productivity.

6.2.4.2 Tasks and change process

Modifying tasks has come to the forefront as one of the most vital change techniques. Tasks are generally easier to change than people, and making tasks more challenging often increases motivation. Changing tasks involves two processes: making tasks either less or more difficult or less or more varied.

6.2.4.3 Technology and change process

Advances in technology (automation of UPID and development of MIS) are the most frequent causes of forced change in the department. The problem with technical change is that it usually occurs quicker and easier than social changes, and thus it tends to create some imbalance in the department. Technology is represented in machines, materials, operating methods, and the knowledge of people, so it has broad ramifications.

6.2.4.4 People and change process

The ultimate effect of planned and unplanned change is on people. Improved technology increases the productivity of employees. Modifying tasks can make work more satisfying, and personal goal setting affects motivation. Efforts should be made to clarify the roles and responsibilities of employees so that they perform more consistently with the expectations of management. People respond to these expectations and, when roles are clarified, behaviour can be affected.

6.2.4.5 MIS organisation structure and change process

Creating MIS organisation structure will help in smooth transition from manual process to Information system based procedures. Reorganising functional areas, modifying jobs, transferring functions, increasing decentralisation, revising procedures and shuffling duties all cause department and its members to adopt new ways of operating.

6.2.5 Change Management Techniques and Strategies

At the heart of change management lies the change problem, that is, some future state to be realised, some current state to be left behind, and some structured, organised
process for getting from one to the other. Changes resulting from each of the management variable will be taken care by following the change management strategies. Moving from one state to another is typically accomplished as a result of setting up and achieving following three types of goals:

1. Transform
Transform goals are concerned with identifying differences between the two states.

2. Reduce
Reduce goals are concerned with determining ways of eliminating these differences.

3. Apply
Apply goals are concerned with putting into play operators that actually affect the elimination of these differences.

Under any of these circumstances, the steps to be followed are as follows.

1. The need for change is recognised.
2. A diagnosis is made of the situation.
3. The new behaviour or future desired condition (goal) is identified.
4. Various change techniques (alternatives) are considered.
5. An appropriate technique(s) is selected.
6. Plans are made for implementation.
7. Teams are built to achieve the desired state.
8. Training imparted to teams, if required.
9. Implementation Occurs.
10. Evaluation, follow-up, and reinforcement are conducted until success is achieved and behaviour is modified.

Change management strategies along with their description are mentioned in table 6.4
### Table 6.4
Change Management Strategies

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rational-Empirical</td>
<td>People are rational and practical and will follow their self-interest — once it is revealed to them. Change is based on the communication of information.</td>
</tr>
<tr>
<td>Normative-Re-educative</td>
<td>People are social beings and will adhere to cultural norms and values. Change is based on redefining and reinterpreting existing norms and values, and developing commitments to new ones.</td>
</tr>
<tr>
<td>Power-Coercive</td>
<td>People are basically compliant and will generally do what they are told or can be made to do. Change is based on the exercise of authority and the imposition of sanctions.</td>
</tr>
<tr>
<td>Environmental-Adaptive</td>
<td>People oppose loss and disruption but they adapt readily to new circumstances. Change is based on building a new organisation and gradually transferring people from the old one to the new one.</td>
</tr>
<tr>
<td>Participation</td>
<td>People who participate will be committed to implementing the change. Any relevant information they have will be integrated into the change plan.</td>
</tr>
<tr>
<td>Negotiation</td>
<td>Situations where someone or some group will clearly lose out in a change, and have considerable power to resist. Sometimes it is relatively easy way to avoid major resistance.</td>
</tr>
</tbody>
</table>

#### 6.2.5.1 Factors in selecting Change Strategy

There is no single change strategy as such. The given initiative is best served by mix of strategies. Which of the preceding strategies to use in mix of strategies is a decision affected by a number of factors. Some of the more important ones follow:
a.Degree of Resistance

Strong resistance argues for a coupling of power-coercive and environmental-adaptive strategies. Weak resistance or concurrence argues for a combination of rational-empirical and normative-re-educative strategies. Participation and negotiation strategies are required for both type of resistance. As UPID has large number of employees, their average age is also high hence degree of resistance to change is strong.

b. Target Population

Considering large target population of UPID a mix of all strategies as mentioned above will be appropriate. Large target population consists of people from different culture, background and social set up.

c. The Stakes

High stakes argue for a mix of all strategies as mentioned above. A large amount of money is funded to this project and a high return is expected hence nothing can be left to chance.

d. The Time Frame

Short time frames argue for a power-coercive strategy. Longer time frames argue for a mix of rational-empirical, normative-re-educative, and environmental-adaptive strategies. Participation and negotiation strategies are required for both shorter and longer time frame. UPID is spread across large geographical locations, has a large number of employees and are involved in varied nature of tasks hence it will require large time frame to institute department wide change.

e. Expertise

Having available adequate expertise at making change argues for some mix of the strategies outlined above. Not having it available argues for reliance on the power-coercive strategy.

6.2.5.2 Instituting Change Strategy

For instituting change a core team of enthusiasts has to be identified as mentioned earlier. Core team of enthusiasts shall comprise of chief engineer, superintending engineer, executive engineer, assistant engineer and junior engineer. The key factors that govern an organisation are people, tasks, goals, technology, and organisation structure and processes. Hence depending on the type of change a team from enthusiasts for each key factor will be formed. The number of members in the team will depend on the type and criticality of the change. Following are the general guidelines for management initiated change process on which core team will work for
smooth transition from largely manual process to highly structured management information system based systems and procedures:

a. **Inform**

Communicate to those involved as far in advance as possible the reasons for the change and the associated benefits. People need to know what is going to occur and why to dispel their fears. Informed people make informed judgments: rumour and uncertainty are too frequently converted into veiled threats and protectionist stances.

b. **Plan**

Plan proposed changes in detail and allow time for reflection. This should include a consideration of all repercussions including retraining, relocation, the need for new procedures and policies. It is important to set the stage for change.

c. **Prepare**

Make changes as gradually as conditions permit. People tolerate evolution more than they do revolution. Advanced preparations should smooth the path for the transition.

d. **Participation**

Involve people in planning the change where possible. Those affected should be permitted to express their objections in advance. If people participate in what is happening, they will be more likely to go along. Participation is the key concept in gaining acceptance. People support what they help create or help in decision-making.

### 6.2.6 Evaluating Change

The department must compare the way it operates after implementing change with the way it operated before. It is difficult to assess the effects of changes in the department, as they are harder to measure. Employees can be surveyed, however, and over time it may become obvious that departmental processes and its ability to manage its strategy have increased. Management can also assess whether the change has strengthened cooperation among the divisions and functions and improved departmental efficiency.

Managing change raises another question. Who should carry out the change: internal managers or external consultants? Although internal managers may have the most experience or knowledge about the department’s operations, they may lack perspective because they are too much a part of the organisation’s culture. They also run the risk of appearing to be politically motivated and of having a personal stake in the changes they recommend. Organisations therefore often turn to external consultants, who can view a situation more objectively. Outside consultants, however spend a lot of time learning about the company and its problems before they can
propose a plan of action. It is best to use a mix of internal managers and external consultants to implement the change. After implementing change, managers assess its effects on departmental performance.

6.3 Plan for Data Collection Process

Data defines the organisation; it makes the organisation unique and viable. If an organisation does not closely guard and effectively manage its departmental data, it may survive; but it will most probably not thrive. Since data is the raw material from which information is produced, the management of the entire data/information process is a critical function that will provide lasting value to the department. Data collection is critical in order to establish a knowledge base and to support application system.

6.3.1 Team for Data Collection

In order to formulate beneficial decisions for UPID, a committee should be created to facilitate data collection. UPID will provide access to all the available data necessary for populating the system. However jobs of data collection, conversion to digital formats and digitisation of maps shall be outsourced by UPID.

6.3.2 Data Source

All relevant data, spreadsheets, maps and hard copy reports have to be catalogued and shared with the data-loading agency. As some of the UPID data might be confidential so there shall be strict monitoring of data creation activity by UPID officials. It is advised to have creation of data at UPID offices/premises for better monitoring and to maintain confidentiality and secrecy of data. Data may be abstracted from primary sources and collected for unique reporting requirements. Part of UPID employee data is already being maintained in Database for Employee Management Information System for Transparency (DEMIST) application, so there shall be a provision of extracting that data for the proposed application system.

UPID has generated lot of useful data pertaining to executive functions, water resources/Irrigation schemes in various parts of Uttar Pradesh. In addition to above, often it has to obtain/procure some data from other government organisations/agencies like Central Water Commission (CWC), Survey of India (SOI), Geological Survey of India (GSI), Central Ground Water Board (CGWB), State Ground Water Department, Department of Space, Census, Agriculture department, State Treasury, Revenue department etc. to carry out its various tasks. These may include following different kinds of data elements:

- Data related to executive functions like human resource, establishment and employee data, budget information, financial accounting data, payroll data, assets information, stores data, litigation data and data related to audit, assembly question and parliamentary questions etc.
?? Location data like districts, tehsils, block, town, villages, water balance unit, sub-basin, basin, hydro-geological basins, topography, monuments and temples, aerial photographs, roads, railways

?? Hydrological data for surface water e.g. river, water quality, inter state water transfer issues etc.

?? Canal System data like gross command area, cultivable command area, head/tail discharge, total canal length, irrigation intensity, cropping pattern, irrigation potential utilisation, water logged area, drainage network

?? Ground water resources data viz. availability of ground water sustainable yields and estimate of potential recharge, installed pumps, hydro-geological basins, aquifers, wells, ground water levels

?? Water storage viz. structures, reservoir, reservoir operation, tanks

?? River diversion structures viz. diversion structures, diversion operation

?? Irrigation water distribution system viz. irrigation channels, irrigation schemes, irrigation structures, measuring structures

?? Meteorology and climate viz. agro-meteorological data, rain gauge stations

?? Land data viz. land use data, soil data

?? Agriculture: Agro-climatic regions, agro-climatic zones, soil maps, crops and cropping patterns

?? Industrial data

?? Water resources usage data

?? Socio-economic data: population, socio-economic infrastructure

?? Environmental impact assessment data

6.3.3 Data Format

With the various types of data collected in many different methods from various sources, it is likely that data collection may not be consistent. To ensure consistency of data, it is to be collected in the prescribed format suggested by developer/vendor of application software as per the need of the application system for UPID. It is important to maintain the consistency of formats in which data is being collected. If data were not collected in the proper formats then it will be mammoth task to validate this data. Data collection should be carefully managed in UPID.

6.3.4 Data Collection

Collected data should be reliable. It should provide the necessary detail to answer important decisions. The main function of UPID regarding data collection is to ensure the quality of data. This responsibility is critically important, because data quality
problems can threaten UPID's ability to operate efficiently. If information is suspect, a considerable expenditure of resources may be required to find missing data, correct inaccurate data and solve data-related issues. All characteristics of data quality management shall be applied to data collection processes, including: accuracy, accessibility, comprehensiveness, consistency, definition, granularity, precision, relevance, and timeliness. When faced with a new application the following factors shall be considered in developing data collection process for an application:

?? Responsibility for coordination of data collection activity

?? Skill of people involved in the design of the data collection methodology

?? Clear use of the data

?? Data ownership record

?? Owners participation in the collection process

?? Maintenance of the written data collection process/procedures

?? Time taken to collect the data

?? Impact of data collection on staffing requirements

?? Type of data required for application

?? Source of data collection

?? Level of detail or granularity of data

?? Communication of changes to data dictionary

?? Uniquely defined data elements

?? Existing standards for the data elements and their definitions

?? Edits that are appropriate for each data element

?? Any restrictions on using existing data for application (i.e., availability, time, specificity, reliability, definition)

?? Access to the source of this data

?? Reliability of the data source

?? Testing of data collected to assure that it meets application requirements

?? Incorporation of collection of data into existing workflows

?? Logically sequenced data collection
?? Availability of data at the point of collection

?? Secondary process need to be put in place to ensure collection of the data at a later point

?? Training required for those collecting and providing the data

?? Availability of data collection tools

?? Percentage of data completion required for application

?? Monitoring the quality of data collection

?? Process used to monitor quality of data

In order to reduce the data collection time for application, management shall facilitate employee and vendor involved in data collection. Improving the data collection tool and standardising the definitions between the two operational systems can reduce time taken in the process of data collection. Considerable amount of time will be spent in data collection process and its verification.

6.3.4.1 Data Verification

After data are collected, the resulting report or data file will pass through a supervisory review prior to its official submission for further processing. The purpose of a supervisory review is to ensure that the report is complete, accurate, and meets agency standards. Reports that fail this review are returned quickly to the person who created the report so that they may be corrected and resubmitted.

Once data collection process has been planned and defined, it is best to follow the process from start to finish, ensuring that the plan is being executed consistently and accurately. Data collection shall be followed up with some form of training or demonstration that will further enhance a common understanding of the data collection process as defined in the plan. Depending on the length of time it takes to collect data and whether the data collection is ongoing, providing periodic oversight will help to ensure that there are no shortcuts taken and that any new participants are properly oriented with the process to preserve consistency.

6.4 User Access Approach

An information system must have reliable security features to ensure only that data, which an employee is entitled and authorised to access, is available from the system. Besides, there are different levels of access to the information that is present in the system. By ensuring proper user access to information system, unauthorised usage can be prevented. Information system needs to have requisite verification, authentication and authorisation for access, creation, modification and deletion of information.
a. Authentication

Authentication methods are based on something only users know (such as a password), something users have (security cards), or something users are (like users’ fingerprint, voice recognition etc). The complexity of the authentication process shall be dependent on the threat associated with an unauthorised person getting access to the system. At present for UPID, password shall be used to measure authentication to access various applications. For instance salary detail, leave detail, provident fund details etc. shall be accessed by employees by providing the necessary authentication in the form of password.

b. Authorisation

Authenticated users have different permissions to use application systems depending upon users’ level in the departmental hierarchy. The authorising level to application system ensures data integrity and confidentiality. Each employee will be assigned a particular role and level of access will depend on the role into which employee is classified. Based on users’ role, user shall have access permissions to read, modify, or create data records and authorise a transaction.

6.4.1 Roles

The major roles suggested for UPID users are data entry operators and supervisors. The supervisory roles shall comprise of approver, manager and super user sub roles. The user access will depend on need and responsibility of user. All users requiring data access shall be assigned at least one role. The actual roles shall be defined during the design and construction phase of the information system in consultation with the application system provider/ developer and UPID officials.

a. Data Entry Operators

Users under this category will be responsible for entering the complete data into the application in the required format. For UPID, the clerks, who are currently performing the data entry, would perform these roles or this activity will be outsourced.

b. Supervisors

The employee who currently verify, validate and approve reports will be assigned the supervisory role. This role can be further divided into sub roles based on the level of approval/ authorisation for each process as per UPID need. The sub roles in the supervisory category could be as follows:

?? Approver

An approver approves the process after its data entry. There could be various levels of approval for a process. For instance, in case of preparation of estimate for works activity, the various approver levels will depend upon the work for which the estimate
is being prepared. After approval from one level it shall pass to another level for further approval. The approver will have access to view the report and can make modifications to it depending upon his authorisation powers.

?? Manager
A manager owns a process and has the overall accountability for the process. Manager is responsible for the completeness, correctness and authentication of the information. For instance, Divisional Accounts officer is the manager for the financial accounting activity for the division. A manager will have access to read and edit the data for all locations he manages.

?? Super User
A super user has the most comprehensive access to an application system. A super user shall be responsible for technical and functional applications. A technical super user has control over the access to an application system. Technical super user in UPID shall comprise of chief information officer and system managers who would have overall responsibility for administering the information system. Some of the responsibilities of super user are as follows:

?? Defining, creating and modifying access levels for end users based on users’ departmental hierarchy

?? Making changes to the application system parameters

?? Enhancements or changes to the application system

A functional super user shall be the head of a function and has access to all the information pertaining to his domain. In certain cases, the functional super user could act as an application owner. For instance, some of the information Chief Engineer needs to have is as follows:

?? Irrigation intensity

?? Water level in reservoirs

?? Status of internal and external audit

?? Skill levels of employees

?? Budget allocated and expenditure against a major head

?? Training needs of employee

An employee could be assigned multiple roles depending upon requirement of a process and employees’ departmental hierarchy. The roles mentioned here are based on the nature and type of work being done by UPID. If UPID wants, then user access roles can be further divided into sub roles as per their need in consultation with the application vendor/developer.
6.5 Business Process Improvement Plan

UPID is a department that is over 150 years old. The objective of UPID is to improve the process to achieve desired results; to make processes efficient to minimise resources; and to make processes adaptable to meet the changing needs. Improvement can take many forms. Barriers must be removed which interrupts the flow of work and processes must be streamlined to reduce waste. The way to improvement is through Business Process Improvement (BPI). This section will only provide an overview of BPI. It will be detailed in Phase 1 of the assignment.

BPI will help UPID to make advances in the way its processes operate. It will provide a system that will aid in simplifying and streamlining operations. The main objective of BPI is to create an effective, efficient and adaptable process by ensuring that the process: Eliminate errors; Minimise delays; Maximise the use of assets; Promote understanding; Are easy to use; Are adaptable to changing needs;

BPI will involve documenting how the work and information flows through the department and will involve identifying processes in UPID. A process will be the logical organisation of work activities with definable start and end points and brings about a result.

6.5.1 Phases for Business Process Improvement

The phases that are important for business process improvement are:

?? Organising for Improvement: The objective is to ensure success by building leadership, understanding and commitment. UPID will appoint a person responsible for BPI related activities. The person will be responsible to communicate the purpose of BPI to the employees of UPID.

?? Understanding the Process: The objective is to understand all the dimensions of the current business process. The consultants has already documented the “as is process” of UPID along with the objectives and critical success factors for each process.

?? Streamlining: The objective is to automate the process to improve its efficiency and effectiveness. Training will be provided to UPID employees for the changes made for streamlining. Streamlining will result in reduction of process time, reduction in number of errors, procurement/ upgradation of equipments and automation of processes.

?? Measurements and Control: The objective is to implement a system that will control the process for ongoing improvement. A system will be required to obtain feedback on performance of improved processes.

?? Continuous Improvement: The objective is to implement a continuous improvement process. A quality control system will be established that will result in audit and periodic reviews to define and eliminate process problems.
6.5.2 Pre-requisite for Business Process Improvement

Management support is essential for the improvement envisaged for UPID in this project. A long-term commitment and a focused approach are required for the entire duration of the improvement phases. A team dedicated to BPI will be critical to the success of improving the business processes.

6.5.3 Steps to Business Process Improvement

UPID needs to identity a team of key personnel and assign responsibilities to the team for BPI before embarking to implement BPI. The involvement of the team from UPID will be critical to the success of BPI. The team member must be an expert in their area of work. The team must consist of at least one member from each functional area.

Understanding process characteristics is necessary because it helps identify key problem areas and the information obtained helps in streamlining of the process; it provides information for making informed decisions about improvements. An in depth understanding of UPID’s processes will be developed and documented. The objectives, critical success factors, key performance indicators etc. for the process of each functional area will be identified and documented after extensive discussions with UPID team identified for the project.

Streamlining the processes will result in elimination of duplication, error proofing, standardisation, upgradation and automation. As part of streamlining, the automation requirement of UPID will be identified. The automation requirement will include requirements related to software, hardware and communication needs of UPID. After the identification of the requirement, UPID will proceed to procure and install the necessary software, hardware and communications equipments. The bidding document for each item will be prepared and the document will detail the technical specifications for procurement.

UPID’s processes are largely manual. There will be a shift in the working environment of UPID with improvement being proposed in the system. The employees’ mindset will also require a shift. This entails extensive training to the employees for each component of BPI and comprehensive change management plan. The strategies to deal with anticipated change in the environment is covered in the change management section of the report.

Training will be an important component in implementation of BPI plan. Trainings are proposed to be provided for each component of MIS project. Trainings will better equip UPID employees for the impending change.

Measurement is important in the business process because it focuses on the achievement of the objectives; it shows how effectively resources are used; it helps to monitor trends; it provides inputs for analysing primary causes and sources of errors; it identifies opportunities for continued improvement; it helps to assess progress. A system will be devised to monitor whether the streamlining of processes have yielded desired result or not.
BPI is a continuous cycle of improvement. The business environment continues to change. There continues to be new methods, programs, and equipment to be evaluated and deployed, if necessary. Stakeholders' expectations change, which will require UPID to continually evaluate their abilities to meet the changing needs. People within the department will continuously develop knowledge and capabilities that can be used for process improvements.

### 6.5.4 Benefits of Business Process Improvement

Some of the benefits of BPI are:

- Increases productivity
- Provides means to take full advantage of new technologies, software or tools
- Resolves conflicting needs between identified functional areas
- Results in automation/computerisation
- Increases teamwork
- Helps in taking informed decisions
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