IMPLEMENTATIONS OF INFORMATION SYSTEMS

WHAT IS INFORMATION SYSTEM?

- An integrated set of components for collecting, storing, and processing data and for delivering information, knowledge and digital product.
- A combination of hardware , software, infrastructure and trained personnel organized to facilitate planning,control,coordination,and decision making in an organization
- Business firms and other organizations rely on information systems to carry out and manage their operations, interact with their customers and suppliers, and complete in marketplace.
- **Data**

  Data is information stored in its raw form.
- **People**

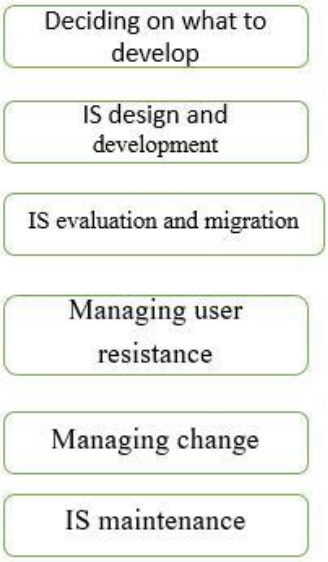
  Technical people are required to design database and programming
- **Hardware**

  Web servers, routers,switches,LAN,firewall etc.
- **Software**

  DBMS,applications ,programming languages etc.
- **Telecomm nication**

  As etworking technologies

6 KEY EVENTS



Types of IS

1. Office Information Systems
2. Transaction Processing Systems
3. Management Information Systems
4. Decision support System
5. Expert Systems
6. Integrated Information Systems

Examples

- Data warehouses
- Enterprise Resource Planning
- Enterprise Systems
- Expert Systems
- Search Engines
- Geographic Information system
- Global Information system
- Office Automation

Implementation of IT in Nepal Telecom

- Use of computer and computer –based systems were started from 1984

- To bring efficiency in day-to-day operation of telecom business like: Line maintenance, Line installation, Billing, Cash collections etc.

  Computerization activities of NTC is divided into different subsystems to solve different areas of operation

✓ Service Division System(SDS)

✓ Human Resource Management Systems(HRMS)

✓ Inventory Control System

✓ Financial system Division(FSD-Billing and Cash Collection)

✓ General Accounting(GA)

Behavioral Science

- Behavioral consideration in the design and implementation of Information systems and in the management of IS professionals are crucial to successful development and delivery of quality services to the users
- Implementation of IS may provide a beneficial means to facilitate changes in task design, organizational structure, and social relations.
- Guidance for interpreting past MIS behavioral research and suggestions for future studies are provided by a proposed research framework
- The importance of adopting behavioral science research standards e.g. theory based research questions and appropriate methodology is stressed

Theories of Behavioral Science

✓ Abraham Maslow's Hierarchy of Needs Theory

Sati fy lower-level needs first

✓ James March and Herbert Simon

Communication is essential

✓ Douglas McGregor's Theory X and Y

Negative X and positive y assumption about people

✓ Victor Vroom's Expectancy Theory of Motivation

Motivate to reach goal

✓ Fredrick Herzberg's two Factor Theory

Hygiene factors and motivators

✓ Chester Barnard

Must maintain a system of co-operation

6.1. CHANGE MANAGEMENT

Change management (CM)

- It is an approach to transitioning individuals, using behavioral sciences, whereas ORGANIZATIONAL Change Management (OCM) considers the full organization and what needs to change. The subsequent Organizational Change Manag ment principles and practices, will include CM as a tool for only the people-side of change.
- CM focuses on how people and teams are affected by an organizational transition. It deals with many different disciplines, from behavioral and social sciences to information technology and business solutions. In a project management context, change management may refer to the change control process wherein changes to the scope of a project are formally introduced and approved
- Change management is a systematic approach to dealing with change both from the perspective of an organization and the individual
- **In an information technology (IT)** system environment, change management refers to a systematic approach to keeping track of the details of the system (for example, what operating system release is running on each computer and which fixes have been applied).
- Change is inevitable(unavoidable)
- Software Development without consideration for change is bound to fail
- Definition of insanity is continuing to do same thing over and over again ,and expecting different results-Rita Mae Brown
- Changes are difficult to predict and grows in proportion to the complexity of the system/project
- Decisive and functional change management is a decisive factor for project success.

Types of Changes in software Development

1. Changes due unclear requirement:-
    - Changes not clear in the beginning of the project
    - Causes: Change in technology
    - Change in market requirements

2. Developmental changes:-
    - Detailed planning of resources
    - Continuous monitoring of the implemented plan
    - Access progress regularly and make proper plan adjustment
    - Setting objectives as per the purpose and the vision of the project

Organizational Changes

Change Type	**Short Term(3-9 months)**	**Long Term(1 year+)**
Radical	Restructuring and Redeployment of staff	Business process re-engineering
Incremental(gradual)	Process automation and refinement	Innovation Schemas

6.2 CRITICAL SUCCESS FACTORS

Critical success factor (**CSF**) is a management term for an element that is necessary for an organization or project to achieve its mission. It is a critical factor or activity required for ensuring the success of a company or an organization. The term was initially used in the world of data analysis and business analysis. For example, a CSF for a successful Information Technology (IT) project is user involvement

- "Critical success factors are those few things that must go well to ensure success for a manager or an organization, and, therefore, they represent those managerial or enterprise area, that must be given special and continual attention to bring about high performance. CSFs include issues vital to an organization's current operating activities and to its future success."
- Limited number (usually between 3 to 8) of characteristics, conditions, or variables that have a direct and serious impact on the effectiveness, efficiency, and viability of an organization, program, or project. Activities associated with CSF must be performed at the highest possible level of excellence to achieve the intended overall objectives. Also called key success factors (KSF) or key result areas (KRA).

Success of IS Project

- As stated in several studies in the literature, nearly 80% of IS projects fail
- An unsuccessful project exceeds its schedule and budget yet might not still reach to end
- Companies try to avoid such project failures due to high investments in terms of money, time and man power
- The critical Success factors can be listed that affect the success of the project

What are they?

- Those few things that must be done well for the organization to survive and/or prosper
- These factors are common in most of the studies , yet weights and the priorities may change according to the company’s structure, culture, region and IS project’s volume

Why have them ?

- To help an individual manager determine his/her information needs
- To aid an organization in its general planning process (i.e. business planning)
- To aid an organization in its information system planning process

For whom?

- For senior and middle management
- But not as the same group
- Different levels of management will have different CSFs
- To use CSFs effectively you need to be capable of creative thinking

What are the benefits?

- For specifying critical information systems
- To focus attention on important matters
- Help to link IS strategy to business strategy
- Help to give projects corporate justification

Sources of CFS Ghimire,Dept

- Characteristics of the industry
- Company competitive strategy industry position and geographic location
- Environmental factors
- Extraordinary temporal factors
- Managerial Positions
-

CSFs In IS APPLICATIONS

- Factors about internal organizational structure
- Strategic alignment between organizational structure/infrastructure and IT structure/Infrastructure
- Top management support and commitment to IS
- User participation in IS project
- Matching IT capabilities to organizational needs and goals
- Organizational structure context

- Enough managerial and technical skills

CSFs In IS APPLICATIONS

Factors about project team structure

- ✓ Project leader feedback to team
- ✓ Experience of project leader
- ✓ Project monitoring and control
- ✓ Adequate training for team members
- ✓ Peer review on project progress
- ✓ Experience of team members
- ✓ Team member commitment
- ✓ Team member self control

Appropriate technology and project methodology

- ✓ Clearly stated objectives
- ✓ Detailed project plan
- ✓ Proper project scope
- ✓ Utilizing effective methodology
- ✓ Use of appropriate technology
- ✓ Effective system implementation

After project support

- ✓ Training of users
- ✓ Software support
- ✓ Training of IT staff
- ✓ On time help to users

Environmental factors

- ✓ Globalizations
- ✓ Environmental dynamism
- ✓ Competition

6.3. ADVANCED BALANCED SCORECARD

The Balanced Scorecard is a strategic performance management framework that enables organizations to identify, manage and measure its strategic objectives. Initially introduced by Drs Robert Kaplan and David Norton in a Harvard Business Review (HBR) article in 1992, the Balanced Scorecard was chosen by HBR one of the most influential business ideas in the magazine's 75 year history from 1925-2000.

Like most good ideas, the scorecard is conceptually simple. Kaplan and Norton identified four generic perspectives that cover the main strategic focus areas of a company. The idea is to use this model as a template for designing strategic objectives, measures, targets and initiatives within each of the following perspectives:

- The **Financial Perspective** covers the financial objectives of an organization and enables managers to track financial success and shareholder value.
- The **Customer Perspective** covers the customer objectives such as customer satisfaction, market share goals as well as product and service attributes.
- The **Internal Process** Perspective covers internal operational goals and outlines the key processes necessary to deliver the customer objectives.
- The **Learning and Growth Perspective** covers the intangible drivers of future success such as human capital, organizational capital and information capital including skills, training, organizational culture, leadership, systems and databases.
- Balance Scorecard is the de-facto("in fact, in reality, in actual existence, force, or possession, as a matter of fact") standard in the world of strategic performance scorecards for meas ring financial and non-financial performance

Advantages/ Benefits of using a scorecard includes:

1. Better Strategic Planning - The Balanced Scorecard provides a powerful framework for building and communicating strategy. The business model is visualized in a Strategy Map which forces managers to think about cause-and-effect relationships. The process of creating a Strategy Map ensures that consensus is reached over a set of interrelated strategic objectives. It means that performance outcomes as well as key enablers or drivers of future

performance (such as the intangibles) are identified to create a complete picture of the strategy.

2. Improved Strategy Communication & Execution - The fact that the strategy with all its interrelated objectives is mapped on one piece of paper allows companies to easily communicate strategy internally and externally. We have known for a long time that a picture is worth a thousand words. This "plan on a page‟ facilities the understanding of the strategy and helps to engage staff and external stakeholders in the delivery and review of strategy. In the end it is impossible to execute a strategy that is not understood by everybody.
3. Better Management Information - The Balanced Scorecard approa h forces organizations to design key performance indicators for their various strat gic objectives. This ensures that companies are measuring what actually matters. Research shows that companies with a BSC approach tend to report higher quality manag m nt information and gain increasing benefits from the way this information is used to g ide management and decision making.
4. Improved Performance Reporting - companies using a Balanced Scorecard approach tend to produce better performance reports than organizations without such a structured approach to performance management. Increasing needs and requirements for transparency can be met if companies create meaningful management reports and dashboards to communicate performance both internally and externally.
5. Better Strategic Alignm nt - organizations with a Balanced Scorecard are able to better align their organization with the strategic objectives. In order to execute a plan well, organizations need to ensure that all business and support units are working towards the same goals. Cascading the Balanced Scorecard into those units will help to achieve that and link strategy to operations.
6. Better Organizational Alignment - well implemented Balanced Scorecards also help to align organizational processes such as budgeting, risk management and analytics with the strategic priorities. This will help to create a truly strategy focused organization.

How many companies use the Balanced Scorecard?

About half of major companies in the US, Europe and Asia are using Balanced Scorecard approaches. The exact figures vary slightly but the Gartner Group suggests that over 50% of large US firms had adopted the Balanced Scorecard by the end of 2000. A study by Bain & Co finds that about 44% of organizations in North America use the framework and a study in Germany, Switzerland, and Austria puts the figure at 26%. The widest use of the scorecard can be found in the US, the UK, Northern Europe and Japan.

ADVANCE BALANCE SCORECARD

- BSC is no longer enough to manage discrete functions separately and hope the results of each will aggregate to meet corporate objectives
- Balance Scorecards lack arguably the most important element of non-financial performance namely, "sustainability context"Computerforasuring corporate impacts across the triple bottom line (environmental ,social ,economic) "in the context of the limits and demands placed on environmental or social resources at the sectorial ,local ,regional ,or global level"
- The measures and related accountability associated with balanced scorecards must cascade from the executiveGhimire,Deptlevelthroughout the organization. This suggests that every individual 's performance is aligned with one or more of these measures
- Past balanced scoreca d fforts soften times consisted of metrics that were aggregated, usually using spreadsheets on standalone balanced scorecard applications which lacked the critical alignment shared responsibility, and "cause and effect" relationships that are absolutely vital
- It may not be necessary to implement every single balanced scorecard concept to get value from their efforts
- Previous balanced scorecard application have failed or been abandoned because companies attempted to implement a conceptually perfect solution only to find that they didn't currently capture or store certain balanced score measures.
- Companies today are taking more of iterative approach, started with those measures supported by information that they do have which is usually stored in data warehouse.
- These systems-thinking-enabled balanced scorecards are especially useful for:

- Defining and then executing the corporate strategy.
- Communicating effectively
- Quickly identifying the root causes of potential problems and responding proactively.
- Altering decision makers about early indicators of trouble.

Advance Balance Scorecard involves

- Advanced strategic foundations development
- Advanced objective & strategy map development
- Advanced performance management
- Implementation & visualization
- Strategic initiative prioritization & management
- Advanced scorecard alignment & cascading
- Dashboard

DASHBOARD

In management information systems, a **dashboard** is "an easy to read, often single page, real-time user interface, showing a graphical presentation of the current status (snapshot) and historical trends of an organization's or computer appliances key performance indicators to enable instantaneous and informed decisions to be made at a glance.

In real-world terms, "dashboard" is another name for "progress report" or "report." Often, the "dashboard" is displayed on a web page that is linked to a database which allows the report to be constantly updated.

For example, a manufacturing dashboard may show numbers related to productivity such as number of parts manufactured, or number of failed quality inspections per hour. Similarly, a human resources dashboard may show numbers related to staff recruitment, retention and composition, for example number of open positions, or average days or cost per recruitment

	Dashboard	**Balanced Scorecard**
Is used for…	performance measurement / monitoring	performance management

As a measurement tool is…	metric	KPI (Metric + Target). Read also: The difference between metric and KPI.
Measure is linked to business objectives…	doesn't link	links
It measures…	performance	progress (the current value versus the target value)
It is updated…	in real-time	periodically (monthly)
It focuses on…	operational (short-term) goals	strategic (long-t rm) goals
Its purpose is to	give a high-level idea of what is happening in the company	plan and execute a strategy, identify why something is happening and what can be do about that
Its helps…	visualize the performance to understand the current state	align KPI, objectives, and actions to see the connection between them
In automobile it is…	automobile dashboard (shows how your car is operating)	GPS (shows when and how you will arrive?

Contrast the process of design

The Balanced Scorecard design process is **up to down** (with some exceptions). It starts with global business objectives and then moves down to KPIs level. The dashboard is more oriented on an operational level; as a result the process starts with the identification of relevant metrics and monitoring of their values. If something happens, an executive needs to analyze the cause and effect connection between various parts of the business system to find out what is needed to be done to fix the problem.

Dashboard Process	Balanced Scorecard Process

1. Identify the goals of the dashboard and metrics.	1. Identify and map business objectives on the strategy map with a case-and-effect connection
2. Design a visual interface with charts and diagrams.	2. Define KPIs with targets and benchmarks, align KPIs with business objectives.
3. Monitor performance regularly.	3. Define action plan according to the strategic objectives.

Common features of a dashboard and a balanced scorecard

- **Who uses a dashboard and a scorecard?** It is hard to distinguish who uses the dashboard and who uses the Balanced Scorecard. Some companies reported that their Balanced Scorecard is available only for executives, other prefer to share it with all of their employees. A Dashboard is supposed to be available for supervisor roles only, but some companies think that this valuable information can help line-level empl yees in their daily job as well. Generally speaking both tools are historically business measurements and management tools of executives and top managers.
- **Dig into cause and effect.** What happens when a supervisor receives a warning signal generated by a dashboard? After having a first look at what is going on a supervisor is supposed to understand the cause and effect relation between business objectives, actions and measures.
  That's sounds very close to what the Balanced Scorecard framework suggests doing with business objectives on the strategy map.
- **Measure and KPI.** Although many sources tend to differentiate measures (no target) and KPIs (with target), in practice most companies follow the idea of the KPI in the dashboard as well by assigning some synthetic benchmark.

STRATEGY MAPS

Kaplan and Norton write:

"The measurement system should focus on the entity's strategy – how it expects to create future, sustainable value. …Without a comprehensive description of strategy, executives cannot easily

communicate the strategy among themselves or to their employees. Without a shared understanding of the strategy, executives cannot create alignment around it. And, without alignment, executives cannot implement their new strategies.

A strategy map provides the visual framework for integrating the organization's objectives in the four perspectives of a Balanced Scorecard. It portrays the cause-and-effect relationships that link specific capabilities in human, information and organization capital with process excellence, and process excellence with the desired outcomes in the customer and financial perspectives.

It's worth mentioning that Kaplan and Norton base their work on Michael Porter's articulation of strategy – about selecting the set of activities in which an organization will excel to create a sustainable difference in the marketplace, and thereby creating sustain d value for its shareholders (or sustainable value in the case of non-profits).

And for the sake of clarity, let's expand on what's encompassed by those different forms of 'capital' referred to above:

- Human capital – skills, knowledge and values
- Information capital – systems, databases, networks
- Organization capital – culture, leadership, alignment, teamwork.

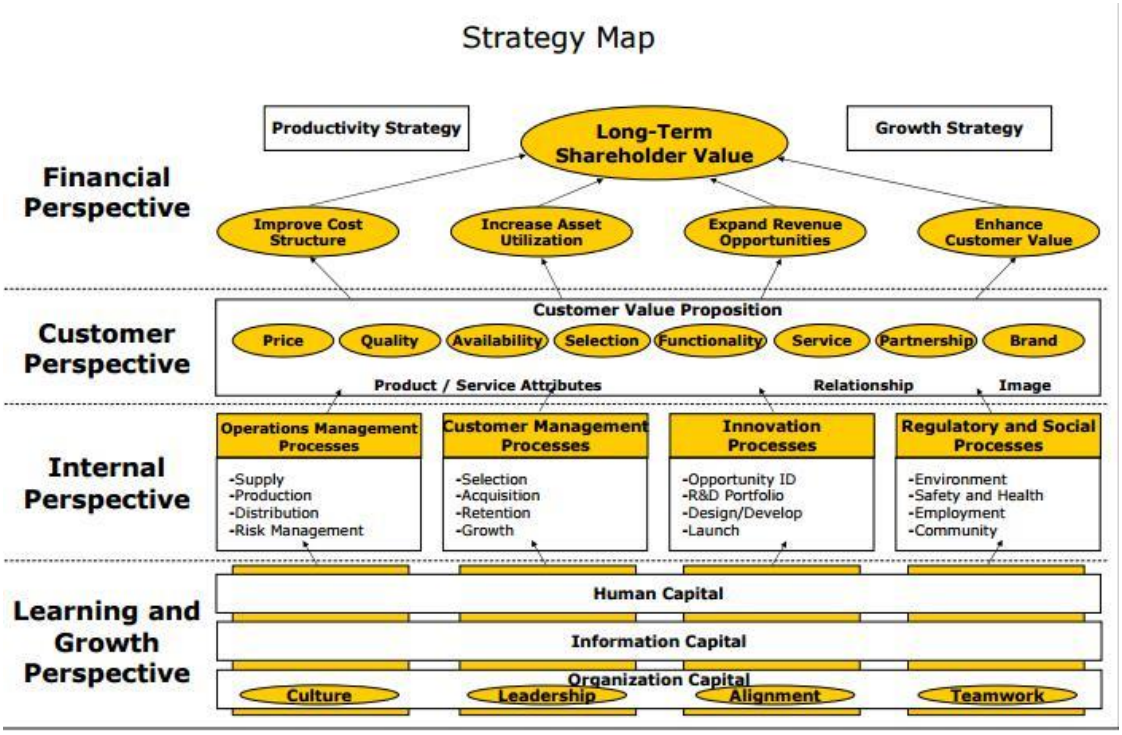
Arrows on the strategy map indicate cause and effect over time, and each perspective is examined in more detail offering up a normative checklist of a strategy's components and interrelationships. Indeed, Kaplan and Norton go so far as to say that if your strategy fails to address an element in the standard strategy map then it is probably flawed. In other words, the strategy mapping process is often so demanding, in a constructive way, that it prompts an immediate review of the strategy definition pha e.

As you might suspect, developing a comprehensive strategy, mapping it and then designing and maintaining the corresponding Balanced Scorecard isn't a simple task that you can start during morning coffee and complete in time for afternoon tea. Every organization is unique, every business unit is unique, every business unit's strategy is unique, and every business unit's strategy map and Balanced Scorecard is unique. BPM consultants and in-house specialists make it their job

to get to grips with the strategy maps and Balanced Scorecard processes and their continued honing.

In *The Execution Premium*, Kaplan and Norton present a six-stage, closed-loop management process:

1. Define the strategy – mission, values, vision, strategic analysis and formulation
2. Plan and translate the strategy – with strategy maps and Balanced Scorecards
3. Align the organization – with cascading linked strategy maps and Balanced Scorecards, to team and employee personal objectives and incentives
4. Link to operational processes – plan how operations should run to exe ute the strategy
5. Monitor and learn – management review meetings focused on problems, barriers and challenges
6. Test and adapt the strategy – apply the knowledge accrued in the context of the changing operational environment and emerging strategies to prepare to recommence this loop.



ADAPTIVE QUADRUPLE –BOTTOM-LINE SCORECARD

- The AQBLSC is a tool for measuring business performance that not only considers standard metrics, such as financial, customer, business processes, and employee development-it also evaluates a firm's organizational learning and intelligence(routine and creative learning processes),social responsibility ,sustainability and adaptive capacity
- Major benefits are that the AQBLSC

  Balances between internal and external impacts of the organization.
- Incorporates a management-evaluation perspective that provides a basis for evaluating the quality of management process used.
- Provides a conceptual foundation that can enable more sophisticated formal modeling of measures, and simulation of strategy dynamics
- Offers greater applicability to account for the many ways in which organizational complexity impacts performance
- Adopts a broad-view systems approach that offers a high probability of achieving organizational sustainability and adaptability