Priyanka Umarji
Mrinmoy Biswas

MANAGING THE DIGITAL FIRM USING MANAGEMENT INFORMATION SYSTEM

ALEXIS PRESS
JERSEY CITY, USA

MANAGING THE DIGITAL FIRM USING MANAGEMENT INFORMATION SYSTEM

MANAGING THE DIGITAL FIRM USING MANAGEMENT INFORMATION SYSTEM

Priyanka Umarji

Mrinmoy Biswas

ALEXIS PRESS

ALEXIS PRESS

Published by: Alexis Press, LLC, Jersey City, USA
www.alexispress.us

First Published 2022

A catalogue record for this publication is available from the British Library

Library of Congress Cataloguing in Publication Data

Includes bibliographical references and index.

Managing the Digital Firm Using Management Information System by *Priyanka Umarji, Mrinmoy Biswas*

ISBN 978-1-64532-960-2

CONTENTS

CHAPTER 1

ANALYSIS AND EVOLUTION OF THERMAL SURFACING PROCESSES

Ms. Priyanka Umarji
Assistant Professor, Department of Mechanical Engineering,
Presidency University, Bangalore, India.
Email Id: priyankasumarji@presidencyuniversity.in

ABSTRACT:

This research looks at the analysis and development of thermal surfacing methods, which entail carefully controlling the heating and melting of a consumable material to deposit a protective or useful layer onto the surface of a substrate. Due to their capacity to improve the surface qualities of materials, increase wear resistance, and lengthen the lifetime of components, thermal surfacing procedures including welding, thermal spraying, and laser cladding have attracted substantial interest in a number of sectors. The many thermal surfacing methods, their underlying theories, and their applications in sectors including aerospace, automotive, and manufacturing are all thoroughly explored in this study. The paper examines how thermal surfacing procedures have changed over time, emphasizing technical developments, breakthroughs in tools and supplies, and the advent of fresh methods. The study also examines the difficulties and restrictions related to thermal surfacing, such as process control, material compatibility, and affordability. The paper provides information on the efficiency and performance of different thermal surfacing methods via a review of case studies and experimental data. The results help researchers and industry professionals better choose and use thermal surfacing methods for particular applications. They also contribute to a better knowledge of thermal surfacing processes.

KEYWORDS:

Thermal Surfacing Processes, Welding, Thermal Spraying, Laser Cladding, Surface Enhancement.

INTRODUCTION

These techniques apply a coating that serves as resistance to corrosion, erosion, wear, and high temperature oxidation using thermal energy in different ways. The three procedures are thermal spraying, hard facing, and flexible overlaying. When coating materials are sprayed onto a substrate via thermal spraying, they are molten or semi-molten and solidify and cling to the surface. The types of coating materials include pure metals and metal alloys, ceramics (such as oxides, carbides, and certain glasses), other metallic compounds (such as sulphides and silicides), ceramic-metal composites, and specific polymers (such as epoxy, nylon, Teflon, and others). Metals, ceramics, glass, certain polymers, wood, and paper are some of the substrates. Not all substrates can be used with all coatings. The phrases "metallizing" or "metal spraying" are used to describe the procedure for applying a metallic coating [1], [2].

The coating material is heated using oxyfuel flame, electric arc, and plasma arc technologies. Wire, rod, or powders are the first coating materials. When using wire (or rod), the heating source melts the wire's leading end, causing it to separate from the solid stock. After being atomized by a high-velocity gas stream (compressed air or another source), the molten material is subsequently sprayed in droplets upon the work surface. When powder stock is used, a powder feeder distributes the small particles into a gas stream, which then delivers them into

the flame, where they melt due to the expansion of the gases in the flame, which causes the molten (or semimolten) powders to be propelled against the workpiece. The normal range of coating thickness in thermal spraying is 0.05 to 2.5 mm (0.002-0.100 in), which is typically more than other deposition methods.

Thermal spray coating was first utilised to repair worn out regions on old equipment parts and to recover undersized-machined workpieces. Due to the method's success, it is now used in manufacturing as a coating process for a variety of purposes, including corrosion resistance, high temperature protection, wear resistance, electrical conductivity, electrical resistance, electromagnetic interference shielding, and others. As a surface method known as "hard facing," alloys are applied as welded deposits to base metals. Hard facing differs from thermal spraying in that there is fusion between the coating and the substrate, similar to fusion welding (Chapter 29), as opposed to mechanical interlocking in thermal spraying, which is less resistant to abrasive wear. Hard facing is thus best suited for components that need to have strong wear resistance. Applications include coating new components and restoring badly worn, corroded, or degraded surfaces on older components. One benefit of hard facing that should be highlighted is that several common welding procedures, including oxyacetylene gas welding and arc welding, may easily be used to complete it outside of the generally regulated manufacturing setting. Alloys made of cobalt, nickel, and steel are some of the frequently used surface materials. Although thicknesses as high as 9 mm (3/8 in) are feasible, coatings typically range in thickness from 0.75 to 2.5 mm (0.030 to 0.125 in) [3], [4].

A highly hard coating material, such as tungsten carbide (WC), may be applied to a substrate surface via the flexible overlay technique. This is a significant benefit of the technique over other approaches, since it allows for coating hardness up to approximately Rockwell C. Additionally, the method may be utilised to apply coatings just to certain areas of a workpart. A substrate is placed on top of two cloths, one impregnated with brazing alloy and the other with hard ceramic or metal powders, then heated to fuse the powders to the surface. Overlay coatings are typically 0.25 to 2.5 mm (0.010-0.100 in) thick. WC and WC-Co coatings are used in addition to cobalt- and nickel-based alloys. Applications include extrusion dies, rock drill collars, chain saw teeth, oil drill collars, and other components needing high wear resistance.

Welding As Commercial Operation

The main industries where welding is used are (1) building and bridge construction, (2) pipelines, pressure vessels, boilers, and storage tanks, (3) shipbuilding, (4) aerospace, (5) automobile, and railroad [1]. There are several sites and industries where welding is carried out. Many welding procedures are carried out in factories because of how versatile welding is as an assembly method for commercial items. However, a number of the conventional procedures, such arc welding and oxyfuel gas welding, utilise mobile equipment, so these activities are not only restricted to factories. They may be carried out at building sites, shipyards, client facilities and vehicle repair shops. Most welding procedures need a lot of labour. To combine separate pieces into a bigger unit, arc welding, for instance, is often carried out by a professional person known as awelder who manually controls the weld's route or location. When doing manual arc welding in a factory, the welder often collaborates with another employee known as a fitter. Prior to welding, it is the fitter's responsibility to organise each component for the welder.Positioners and welding fixtures are used for this. A welding fixture is a tool used to clamp and keep the parts in place during welding. Because it is specifically constructed for the geometry of the weldment, it must be economically justified based on the number of assemblies that will be produced. A welding positioner is a tool that holds the components while also moving the assembly to the ideal welding position. It's

different from a welding fixture, which simply fixes the pieces in one place. Typically, a site with a flat, horizontal weld route is the desirable one [5], [6].

The majority of procedures employ high energy to melt the surfaces of the parts that will be connected. There is a risk of electrical shock to the worker since electrical power is often the source of thermal energy in welding procedures. There are certain risks associated with specific welding methods. For instance, UV radiation that harms human eyesight is released during arc welding. The welder must put on a special helmet with a dim seeing glass. This glass blocks the harmful radiation, but it is so black that it essentially blinds the welder when the arc is hit. The dangers involved with welding processes are increased by sparks, spatters of molten metal, smoke, and odours. To get rid of the hazardous vapours produced by certain of the fluxes and molten metals used in welding, ventilation facilities must be employed. If the procedure is carried out indoors, specialised ventilation masks or suits are needed.

Automation in Welding

Different types of mechanisation and automation have been created due to the risks associated with human welding as well as in an attempt to boost production and enhance product quality. Machine welding, automated welding, and robotic welding are among the types. Mechanised welding utilising tools that carry out the process while continuously being watched over by an operator is known as machine welding. It is often performed by moving the work in relation to a stationary welding head that is moved mechanically, or by moving the work in relation to a stationary welding head. To manage the process, the human worker must constantly monitor and engage with the machinery.

Automatic welding is the practise of conducting an activity using equipment without the involvement of a human operator. The process is often overseen by a human employee, who may spot deviations from the standard. Automatic welding differs from machine welding in that it uses a weld cycle controller to manage the travel of the arc and the placement of the workpiece without constant human monitoring. To position the work in relation to the welding head during automatic welding, a welding fixture and/or positioner are required. Additionally, it calls for a greater level of precision and uniformity in the welding process's component elements.

For these reasons, automated welding is only appropriate for high-volume manufacturing. In robotic welding, a programmed manipulator or industrial robot is utilised to autonomously control the welding head's movement in relation to the operation This kind of automation may be justified for just a small number of manufacturing units due to the flexible reach of the robot arm and the robot's ability to be reprogrammed for different component combinations. Two welding fixtures plus a human fitter who loads and unloads items while the robot welds make up a typical robotic arcwelding cell. Industrial robots are employed in auto final assembly factories to conduct resistance welding on vehicle bodywork in addition to arc welding [7], [8].

DISCUSSION

The faying surfaces must receive a source of high-density heat energy for fusion to occur, and the ensuing temperatures are high enough to induce localised melting of the base metals. The heat density has to be high enough to melt any additional filler metal that is introduced. The power applied to the work per unit surface area, W/mm2 (Btu/sec-in2), may be used to quantify heat density. The power density has an inverse relationship with the time it takes to melt the metal. For melting to occur at low power densities, a considerable amount of time is needed. If the power density is too low, melting won't happen because heat is carried into the work as quickly as it is added at the surface. It has been discovered that a minimum power density of

10 W/mm2 (6 Btu/sec-in2) is needed to melt the majority of metals while welding. Melting time decreases as heat density rises. Over 105 W/mm2 (60,000 Btu/secin2) of power density may cause localised temperatures that can vaporise metal in the affected area. As a result, there is a realistic range of power density values within which welding may be accomplished. The pace at which welding can be done and/or the size of the area that can be welded are differences among welding procedures in this spectrum.

A comparison of power densities for the main fusion welding procedures. Although oxyfuel gas welding may generate a lot of heat, the heat density is relatively low since the heat is dispersed across a big region. The hottest OFW fuel, oxyacetylene gas, burns at a maximum temperature of around 3500C (6300F). In contrast, arc welding generates significant energy over a smaller region, resulting in local temperatures of between 10,000F and 12,000F (between 5500C and 6600C). In order to melt the metal efficiently for metallurgical purposes, greater power densities are often preferred.

Filler metal and base metal that have both melted completely make up the fusion zone. High levels of metal component homogeneity that have been melted during welding are what define this zone. Convection in the molten weld pool serves as a major driving force behind the mixing of these components. The process of solidification in the fusion zone is comparable to casting. The unmelted edges or surfaces of the components being welded together create the metal during welding. The fact that epitaxial grain development takes place during welding distinguishes solidification in casting from that in casting. The reader may be able to remember that while casting, metallic grains are created from the melt by solid particles forming a 'nucleus' at the mould wall, which is followed by grain development.

Contrarily, the technique of epitaxial grain development used in welding allows atoms from the molten pool to settle on already-existing lattice sites of the nearby solid base metal, avoiding the nucleation step of solidification. As a result, the grain orientation in the fusion zone next to the heat-affected zone often resembles the crystallographic orientation of the area around it. As the fusion zone deepens, a preferred orientation develops in which the grains are generally perpendicular to the weld interface boundaries.

Arc Welding

The heat of an electric arc between an electrode and the work is used to fuse the metals together during the arc welding (AW) process. It displays a typical AW procedure. Electric current discharges over a gap in a circuit to form an electric arc. A thermally ionised column of gas, known as a plasma, through which current runs, maintains its stability. In an AW process, the electrode is brought into contact with the work before being immediately disengaged from it by a little distance to start the arc. Temperatures of at least 5500C (10,000F) are generated by the electric energy from the arc as a result, which is hot enough to melt any metal. Near the electrode tip, a pool of molten metal is created, consisting of the base metal(s) and filler metal (if any is employed). To improve the volume and strength of the weld joint, filler metal is often injected during the welding process. As the movement of the electrode with respect to the task is carried out either manually (machine welding), automatically (automated welding), or robotically (robotic welding). The fact that the quality of the weld joint relies on the ability and work ethic of the human welder is one of the problematic features of manual arc welding.

General Technology of Arc Welding

It is instructive to look at some of the fundamental technological difficulties that pertain to these processes before going into detail into the particular AW procedures. Electrodes Consumable or nonconsumable electrodes are utilised in AW procedures. The source of the

filler metal in arc welding is consumable electrodes. The two main types of these electrodes are rods (sometimes known as sticks) and wire. Welding rods are generally 9.5 mm (3/8 in) or smaller in diameter and range in length from 225 to 450 mm (9-18 in). Consumable welding rods have the drawback of needing to be replaced often, which shortens the welder's arc duration, at least in production welding operations.

The benefit of employing consumable weld wire over welding sticks is that it may be continually fed into the weld pool from spools carrying lengthy lengths of wire, preventing welding stick pauses. The electrode is used as filler metal in the weld joint and consumed by the arc during welding in both rod and wire forms. To prevent melting by the arc, non-consumable electrodes are composed of tungsten (or, in rare cases, carbon). Despite its name, a non-consumable electrode progressively depletes during welding (vaporisation being the main cause), similar to how a cutting tool gradually wears out during machining. Any filler metal required for the operation must be provided by means of a separate wire that is fed into the weld pool for AW procedures that employ nonconsumable electrodes.

Arc Protection The metals being connected are chemically reactive to oxygen, nitrogen, and hydrogen in the air at the high temperatures during arc welding.These reactions have the potential to substantially deteriorate the weld joint's mechanical characteristics. In virtually all AW procedures, some method of protecting the arc from the surrounding air is thus given.Arc shielding is done by enclosing the electrode tip, arc, and molten weld pool in a layer of gas, flux, or both to prevent the weld metal from being exposed to air. Argon and helium are two often used shielding gases, and they are both inert. Oxygen and carbon dioxide are often used in conjunction with Ar and/or He to provide an oxidising environment or to regulate weld form when welding ferrous metals using certain AW techniques.

A flux is a chemical used to either dissolve undesired pollutants and enable removal or to stop the production of oxides and other contaminants. The flux melts and turns into a liquid slag during welding, covering the process and shielding the molten weld metal. After cooling, the slag solidifies and must be afterwards scraped or brushed away. Flux is often designed to do numerous additional tasks, including stabilising the arc, reducing spattering, and providing a safe environment for welding. For each procedure, a different flux application technique is used. The three delivery methods are: (1) pouring granular flux directly onto the welding operation; (2) using a stick electrode coated with flux material; the coating melts during welding to cover the operation; and (3) using tubular electrodes, where flux is stored in the core and released as the electrode is used up. We go into further detail about these methods in our explanations of the various AW procedures. Source of Power for Arc Welding Arc welding uses both direct current (DC) and alternating current (AC). Although less costly to buy and run, AC equipment are often only capable of welding ferrous metals. All metals may be worked with successfully when using DC equipment, which is also known for improved arc control.

Metal arc shield welding SMAW, or shielded metal arc welding, is an AW technique that employs a consumable electrode made of a filler metal rod covered in flux and shielding-producing chemicals. The welding stick, also known as stick welding or SMAW, is normally between 225 and 450 mm (9-18 in) long and 2.5 and 9.5 mm (3/32 in) in diameter. The base metal must be compatible with the filler metal used in the rod, which often has a composition that is quite similar to the base metal. The coating is made of powdered cellulose (i.e., cotton and wood particles), oxides, carbonates, and other components bound by a silicate binder. Additionally, metal powders may be added to the coating to boost the quantity of filler metal and add alloying components. The coating is melted during the welding process, creating slag and a protective environment for the welding operation. Additionally, it aids in maintaining the arc's stability and controlling how quickly the electrode melts. The bare metal end of the

welding stick, which is located opposite the welding tip, is fastened in an electrode holder that is attached to the power source during operation. The holder features an insulated handle so that a human welder may grip it and manage it. SMAW commonly uses currents between 30 and 300 A at voltages between 15 and 45 V. The metals being welded, the kind and length of the electrode, and the desired depth of weld penetration all play a role in choosing the right power settings. A few thousand dollars will get you an electrode holder, a power supply, and connecting wires.

Manual labour is often used to accomplish shielded metal arc welding. Construction, pipelines, mechanical structures, shipbuilding, job shop fabrication, and maintenance work are a few examples of common uses. Due to its increased power density, it is recommended over oxyfuel welding for thicker sections those more than 5 mm (3/16 in). SMAW is the most adaptable and likely the most extensively utilised of the AW procedures since the equipment is portable and affordable. Steels, stainless steels, cast irons, and a few nonferrous alloys are examples of base metals. For titanium, copper alloys, and aluminium and its alloys, it is not utilised or used very seldom.The usage of the consumable electrode stick in shielded metal arc welding as a manufacturing process is a drawback. The sticks must be frequently replaced as they deplete. This shortens the welding process's arc time. The level that is now usable is another restriction. When beginning a new welding stick, current levels must be kept within a safe range to prevent the coating from overheating and melting too soon since the electrode length fluctuates throughout the operation and this length impacts the resistance heating of the electrode. The use of a constantly supplied wire electrode in some of the other AW methods allows them to get over SMAW's restrictions on welding stick length.

While welding low- and medium-carbon steels often uses CO2. Because the weld bead is not covered with slag, there is no need to manually grind and clear the slag when using bare electrode wire and shielding gases. Therefore, using GMAW to do several welding passes on a single joint is suitable. Gas metal arc welding goes by many different names according to the many metals on which it is employed and the variances in the process itself. The technique was first used to weld aluminium utilising inert gas (argon) as an arc shield in the late 1940s. This procedure was known as MIG welding, which stands for metal inert gas welding. The same welding procedure was employed on steel, but it was discovered that inert gases were costly and that CO2 could be used in their place. Consequently, the phrase "CO2 welding" was used. A variety of gas combinations, including CO2 and argon and even oxygen and argon, are now used in GMAW for steel welding. For welding a range of ferrous and nonferrous metals in fabrication activities in factories, GMAW is often utilised. When done manually, it offers a major advantage over SMAW in terms of arc duration since it employs continuous weld wire rather than welding sticks. It also lends itself to automating arc welding for the same reason. Stick welding leaves behind electrode stubs that waste filler metal as well, hence GMAW makes better use of electrode material. Additionally, GMAW has greater deposition rates than SMAW, eliminates the need for slag removal (because no flux is needed), and has considerable adaptability.

Flux-Cored Arc Welding

Arc Flux-Cored Welding To get over stick electrode constraints, this arc-welding method was created in the early 1950s as a modification of shielded metal arc welding. The arc-welding procedure known as flux-cored arc welding (FCAW) uses a continuous consumable tube as the electrode, which has flux and other materials in its core. Deoxidizers and alloying components are examples of additional additives. Because the flexible tubular fluxcored "wire" may be provided in coil form for continuous feeding via the arc welding gun, it is flexible. FCAW is available in two different configurations: gas shielded and self-shielded. Self-shielded flux-

cored arc welding is the term given to the first version of FCAW to be created, which used a flux core to provide arc shielding. This kind of FCAW's core contains components that produce shielding gases to safeguard the arc in addition to fluxes. Similar to gas metal arc welding, the second variant of FCAW, designed particularly for welding steels, derives arc shielding from externally supplied gases. Gas-shielded flux-cored arc welding is this variation. It might be seen as a mix of GMAW and SMAW as it makes use of a shielding gas in addition to an electrode that contains its own flux. Carbon dioxide is often used as a shielding gas for mild steels and argon and carbon dioxide mixes for stainless steels.

Welding using electrogas A continuous consumable electrode (either flux-cored wire or bare wire with externally supplied shielding gases) and moulding shoes are used in the electrogas welding (EGW) process to confine the molten metal. As shown in the procedure is typically used for vertical butt welding. Since no external gases are provided when the flux-cored electrode wire is used, the procedure may be seen as a unique application of the self-shielded FCAW. It is regarded as a unique instance of GMAW when bare electrode wire is used together with shielding gases from an external source.To avoid adding the shoes to the weld pool, the moulding process uses water cooling.The shoes create a container, like a mould cavity, together with the edges of the components being welded, into which the melting metal from the electrode and base portions is progressively poured.The procedure is carried out automatically, and a moving weld head moves vertically upward in one pass to fill the void. Steels (low- and medium-carbon, low-alloy, and certain stainless steels) are used primarily in electrogas welding for the construction of huge storage tanks and ships. EGW can handle stock thicknesses ranging from 12 to 75 mm (0.5-3.0 in). It may be used for fillet and groove welds in addition to butt welding, always in a vertical configuration. Sometimes it is necessary to construct moulding shoes that are specifically suited for the associated joint shapes.

Aquatic Arc Welding This method, which was created in the 1930s, was among the first AW methods to be mechanised. A continuous, reusable bare wire electrode is used in the submerged arc welding (SAW) technique, and a layer of granular flux serves as arc shielding. Automatically fed into the arc from a coil is the electrode wire. The flux is dropped by gravity from a hopper into the joint just before the weld arc. The welding process is totally covered in granular flux, preventing the radiation, sparks, and splatter that are so dangerous in other AW procedures. The fairly bulky face shield necessary for the other procedures need not be worn by the welder operator while using SAW (safety goggles and protective gloves are still needed, however). A glass-like slag is created when the flux that is closest to the arc melts, mixes with the weld metal to eliminate impurities, and then solidifies on top of the weld joint. The weld region is well shielded from the environment and thermally insulated by the slag and unfused flux grains on top, resulting in a relatively delayed cooling process and a high-quality weld joint that is renowned for its toughness and ductility.

Arc Plasma Welding A confined plasma arc is directed towards the weld region while performing plasma arc welding (PAW), a specific kind of gas tungsten arc welding. In PAW, a tungsten electrode is housed in a specially crafted nozzle that concentrates a high-velocity stream of inert gas into the area of the arc to create a high-velocity, highly hot plasma arc stream, as arc-shielding gases, argon, argon-hydrogen, and helium are also used.When plasma arc welding, temperatures may reach 17,000C (30,000F) or more, which is hot enough to melt any known 6metal. The contraction of the arc is what causes the temperatures in PAW to be so high (and noticeably greater than those in GTAW). The power is highly focused to form a plasma jet with a tiny diameter and a very high-power density, even though the normal power levels used in PAWare are lower than those used in GTAW. Around 1960, plasma arc welding was first developed, but it took some time to take off. Its usage as a replacement for GTAW in recent years has increased in places including automotive subassemblies, metal cabinets, door

and window frames, and household appliances. Due to its unique characteristics, PAW has many benefits over conventional AW processes in these applications, including exceptional arc stability, superior penetration control, fast travel times, and great weld quality. The method works to join almost any metal, including tungsten. Metals such as bronze, cast irons, lead, and magnesium are challenging to weld using PAW. The expensive cost of the equipment and the bigger torch size compared to other AW operations are additional restrictions that tend to limit access in specific joint arrangements.

For attaching studs or other comparable components to base sections, stud welding, or SW, is a specialized AW technique example of a typical SW operation, where shielding is achieved by using a ceramic ferrule. The stud is first inserted into a unique welding gun that automatically regulates the timing and power parameters of the stages shown in the sequence. The sole need is for the worker to place the gun against the base work part that will receive the stud and squeeze the trigger. SW uses include heat radiation fins on machinery, threaded fasteners for connecting handles to cookware, and similar assembly scenarios. Stud welding often outperforms rivets, manually arc-welded attachments, and drilled and tapped holes in high-production settings. Spot Resistance Welding By far, resistance spot welding is the most common technique used in this category. It is extensively utilised in the mass manufacture of sheet metal goods including vehicles, appliances, metal furniture, and other goods. The economic significance of resistance spot welding may be understood when one realises that a typical vehicle body has around 10,000 separate spot welds and that the yearly production of cars across the globe is estimated in tens of millions of units.

In the resistance spot welding (RSW) procedure, opposing electrodes fuse the flaying surfaces of a lap joint at a single site. When an airtight assembly is not necessary, this method is used to attach sheet metal pieces that are 3 mm (0.125 in) or less in thickness using a succession of spot welds. The electrode tip, which is most often round but may also be hexagonal, square, or another form, determines the size and shape of the weld spot. The resultant weld nugget has a heat-affected zone that extends just beyond the nugget into the base metals, often measuring 5 to 10 mm (0.2-0.4 in) in diameter. If the weld is done correctly, its strength will be on level with the metal it is joining.

There are two primary categories of materials utilised for RSWelectrodes: (1) copper-based alloys and (2) refractory metal compositions such copper and tungsten mixtures. The greater wear resistance of the second group is well known. The tooling used in spot welding progressively degrades with usage, just as it does in other industrial processes. The electrodes are made with internal channels for water cooling wherever it is feasible. Due to its extensive industrial application, spot-welding operations may be carried out using a variety of tools and techniques. The tools include portable spot-welding guns, rocker-arm and press-type spot-welding machines. The rocker-arm spot welders in feature a mobile top electrode that may be lifted and lowered to help load and unload the job and a stationary bottom electrode. The top electrode is fixed to a rocker arm, thus the name. The worker uses a foot pedal to move the arm. Force and current throughout the welding cycle may be controlled by modern equipment via programming.

For bigger tasks, press-type spot welders are used. A vertical press with either pneumatic or hydraulic power moves the top electrode in a straight line. Larger pressures may be applied because to the press action, and controls often allow for complicated weld cycle programming. The task is carried to the preceding two machine types, which are both stationary spot welders. It is challenging to transfer and place the component into stationary machinery for massive, heavy tasks. Portable spot-welding guns are accessible in these situations, and Resistance Welding for Seams In resistance seam welding (RSEW), spinning wheels are used instead of

the stick-shaped electrodes used in spot welding to create a succession of overlapping spot welds along the lap joint. Petrol tanks, car mufflers and a variety of other manufactured sheet metal containers are among the industrial uses for the method, which may create airtight seams.

Technically speaking, RSEW is identical to spot welding with the exception of a few complications brought on by the wheel electrodes. The seams should be along a straight or consistently curved line since the procedure is often completed continuously rather than individually. Dealing with sharp edges and other discontinuities is challenging. Resistance seam welding also causes the pieces to warp more, therefore fixtures are needed to keep the work in place and reduce distortion.

Resistance seam welding relies on the motion of the electrode wheels in relation to the application of the weld current to determine the distance between the weld nuggets. The typical mode of operation, known as continuous motion welding, involves rotating the wheel constantly at a constant speed while turning on the current at intervals that are compatible with the required distance between spot welds along the seam. The current discharge frequency is often chosen to create overlapping weld areas. The procedure is known as roll spot welding because there will be gaps between the weld spots if the frequency is sufficiently decreased. In another instance

Flash welding is used to link wire ends during wire drawing, butt weld steel strips in rolling mill operations, and weld tubular components. The ends that are going to be linked need to have the same cross section. Flash welding is quick and affordable for these high-production applications, but the equipment is pricey. In contrast to flash welding, upset welding presses the faying surfaces together while heating and upsetting. The heating and pressing stages are separated throughout the cycle in flash welding. In UW, no arcing takes place; all heating is done by electrical resistance at the contacting surfaces. The force forcing the pieces together is raised to promote upsetting and coalescence in the contact zone after the faying surfaces have been heated to a sufficient temperature below the melting point. So, unlike the previous welding techniques we've examined, upset welding is not a fusion welding process. Similar to flash welding, UW is used to connect the ends of pipes, tubes, and other materials.

Similar to flash welding, percussion welding (PEW) has a very brief weld cycle that normally lasts just 1 to 10 milliseconds. Rapid electrical energy discharge between the two surfaces that need to be united, followed by instantaneous percussion of one portion against the other to produce the weld, allows for quick heating. This approach is appealing for electronic applications where the dimensions are extremely tiny and surrounding components may be heat-sensitive since the heating is relatively localised. Since acetylene and oxygen together are very combustible, the setting in which OAW is carried out is risky. Certain risks are especially related to acetylene. A colourless, odourless gas is pure C2H2. Commercial acetylene is treated to have a distinctive garlic smell for safety concerns. The gas has a number of physical restrictions, one of which is that it becomes unstable at pressures considerably higher than 1 atm (0.1 MPa or 15 lb/in2). As a result, porous filler materials (such asbestos, balsa wood, and other materials) that have been soaked with acetone (CH3COCH3) are placed within acetylene storage cylinders.

Liquid acetone dissolves acetylene; in fact, it dissolves nearly 25 times as much acetylene as it does itself, making it a rather safe way to store this welding gas. As an added measure of safety, the welder wears eye and skin protection (goggles, gloves, and protective gear), and distinct screw threads are standard on the acetylene and oxygen cylinders and hoses to prevent unintentionally connecting the incorrect gases. The equipment has to be maintained properly.

OAW equipment is portable and reasonably priced. As a result, it is a cost-effective, adaptable method that works well for small-batch manufacturing and repairs.

Methylacetylene-propadiene is the fuel that most nearly rivals acetylene in terms of burning temperature and heating value. The Dow Chemical Company created the gasoline, which is marketed under the trade name MAPP (we are appreciative to Dow for the abbreviation). MAPP (C3H4) may be kept under pressure as a liquid and has heating properties comparable to acetylene, therefore it doesn't have the unique storage issues that C2H2 has. Oxyhydrogen welding (OHW) is the term for the process of burning hydrogen using oxygen as the fuel. The welding temperature in OHW is lower than the maximum temperature for oxyacetylene welding. It is also more challenging for the welder to regulate the torch since variations in the hydrogen and oxygen combination have no effect on the colour of the flame.

Additionally, natural gas and propane are utilised in OFW. Welding is less directly related to the use of propane (C3H8) than are brazing, soldering, and cutting processes. The two main components of natural gas are ethane (C2H6) and methane (CH4). It produces a high temperature flame when combined with oxygen, and tiny welding shops are increasingly using it. Gas Pressure Welding This is a unique OFW procedure that is differentiated by application type rather than fuel gas0.

By heating the two components with the proper fuel combination (often oxyacetylene gas) and then applying pressure to the surfaces to connect them, pressure gas welding (PGW), a kind of fusion welding, achieves coalescence throughout the full contact surfaces of the two parts an illustration of a common application.

Parts are heated until surface melting starts to occur. The pieces are then pushed together and kept under high pressure until solidification takes place after the heating torch is removed. In PGW, no filler metal is utilised.

CONCLUSION

The lifetime of components and surface qualities may be improved and extended with the help of thermal surfacing technologies, which have seen substantial evolution and development throughout time. Understanding the fundamental concepts, practical uses, and performance characteristics of various thermal surfacing methods, including as laser cladding, thermal spraying, and welding, has been made possible. The research has emphasised how improvements in technology have led to better process control, efficiency, and thermal surfacing quality. The capabilities of thermal surfacing have been increased, and new opportunities for surface augmentation have emerged with the introduction of new methods like laser cladding. However, there are still issues and restrictions with the use of thermal surfacing methods.

The necessity for exact process control to guarantee quality and repeatability, the compatibility of the materials for efficient bonding and layer formation, and cost factors for the equipment, consumables, and post-processing are a few of these. Liquid acetone dissolves acetylene; in fact, it dissolves nearly 25 times as much acetylene as it does itself, making it a rather safe way to store this welding gas.

As an added measure of safety, the welder wears eye and skin protection (goggles, gloves, and protective gear), and distinct screw threads are standard on the acetylene and oxygen cylinders and hoses to prevent unintentionally connecting the incorrect gases. The equipment has to be maintained properly. OAW equipment is portable and reasonably priced. As a result, it is a cost-effective, adaptable method that works well for small-batch manufacturing and repairs

REFERENCES:

[1] A. K. Sethi, “Studies on hard surfacing of structural steel by gas thermal spraying process”, 2020. doi: 10.1016/j.matpr.2019.09.173.

[2] X. Sun, X. Qin, S. Li, C. Zou, C. Wang, en X. Wang, “Characterization of thermal insulating micro-surfacing modified by inorganic insulating material”, Constr. Build. Mater., 2018, doi: 10.1016/j.conbuildmat.2018.04.170.

[3] E. Lavrova, V. Ivanov, V. Royanov, I. Zakharova, en V. Kibish, “Improving a resource-saving surfacing technology using two ribbon electrodes with a controlled transfer of electrode’s metal”, Eastern-European J. Enterp. Technol., 2019, doi: 10.15587/1729-4061.2019.154681.

[4] J. Ehrich, A. Roos, B. Klusemann, en S. Hanke, “Influence of Mg content in Al alloys on processing characteristics and dynamically recrystallized microstructure of friction surfacing deposits”, Mater. Sci. Eng. A, 2021, doi: 10.1016/j.msea.2021.141407.

[5] M. R. Dorfman, “Thermal spray coatings”, in Handbook of Environmental Degradation of Materials, 2005. doi: 10.1016/B978-081551500-5.50022-7.

[6] J. C. Puoza en F. Uba, “Modelling and simulation of surfacing welding remanufacturing for tunnel boring machine disc cutter”, Welding International. 2021. doi: 10.1080/09507116.2021.1973353.

[7] X. Wang, H. Shun, C. Li, X. Wang, en D. Sun, “The performances of TiB2-contained iron-based coatings at high temperature”, Surf. Coatings Technol., 2006, doi: 10.1016/j.surfcoat.2006.04.025.

[8] B. Yang, T. Yu, Q. Deng, C. Chen, en F. Zhang, “Research on optimization of key parts of nuclear reactor based on finite element simulation”, 2021. doi: 10.1088/1755-1315/632/3/032045.

CHAPTER 2

IMPORTANCE OF INFORMATION SYSTEMS IN BUSINESS

Ms. Anandasrinivasan Deviprabha
Assistant Professor, Masters in Business Administration,
Presidency University, Bangalore, India.
Email Id: deviprabha@presidencyuniversity.in

ABSTRACT:

Information systems encompass the hardware, software, data, processes, and people involved in collecting, storing, processing, and disseminating information within an organization. They enable businesses to gather, analyze, and utilize data to enhance operational efficiency, improve customer service, and gain a competitive edge in the market. The components of an information system include hardware devices such as computers, servers, and networking equipment, which provide the infrastructure for data processing and storage. Software applications, ranging from enterprise resource planning (ERP) systems to customer relationship management (CRM) software, enable organizations to automate processes and manage information effectively. Modern businesses depend heavily on information technology to manage data, operations, and decision-making effectively. Utilizing information technology effectively can improve company performance across the board, including productivity and competitiveness. Businesses that gather, store, analyze, and disseminate data and information use a variety of technologies, procedures, and employees known as information systems. These systems consist of a variety of parts, including physical devices, databases, software applications, and network infrastructure. They make it possible for companies to gather, handle, and use data to assist decision-making at various organizational levels.

KEYWORDS:

Analytics, Artificial Intelligence, Big Data, Cloud Computing, Cybersecurity, Data Governance.

INTRODUCTION

In either the American economy or the rest of the world economy, things are no longer as normal. Over $540 billion will be spent by American companies in 2012 on telecommunications equipment, software, and hardware for information systems. They will also spend an additional $650 billion on business and management consulting and services, a large portion of which will be used to reorganize companies' business processes so they can benefit from these new technology. Most of you managers will be employed by businesses that heavily rely on information systems and spend heavily in information technology. Without a doubt, you'll want to know how to use this money sensibly. Your business may surpass rivals if you choose wisely. Poor decisions will result in the loss of important resources. Making informed judgments concerning information systems and technology is the goal of this book.

Business Changes Caused By Information Systems

By examining how individuals do business, you may witness the consequences of this enormous expenditure every day in the world around you. In 2012, more people opened wireless mobile phone accounts than had landlines installed. Mobile devices, texting, email, and internet conferencing have all evolved into crucial work tools. In the United States, 122

million individuals used mobile devices to access the Internet in 2012, accounting for 50% of all Internet users [1]–[4].

Between 1980 and 2011, capital investment in information technology, which is comprised of hardware, software, and communications equipment, increased from 32% to 52% of all capital invested. More than 104 million companies have dot-com Internet sites registered by June 2012, according to statistics. 150 million Americans have made purchases online, and 184 million do their shopping online. Approximately 67 million Americans use the internet daily to do product or service research. FedEx carried more than 9 million parcels per day, usually overnight, in 2012, while United Parcel Service handled more than 15 million. Businesses attempted to perceive and adapt to fast shifting client demand, get rid of as much inventory as they could, and increase operational efficiency. Supply chains have accelerated, with businesses of all kinds relying on just-in-time inventories to save costs and speed up time to market.

More than 150 million people read a newspaper online, and millions more visit other news websites, despite the continued drop in newspaper circulation. The number of people who watch videos online each day has increased to around 67 million, while the number of people who read blogs has increased to about 76 million, and the number of people who post to blogs has increased to about 26 million.

Website for social networking in 2012, Facebook drew over 900 million users globally and 162 million users per month in the United States. In the US, Google+ has amassed more than 100 million members. Businesses are beginning to link their workers, clients, and management globally via social networking platforms. Today, a large number of Fortune 500 corporations have Tumblr, Twitter, and Facebook profiles. E-commerce and Internet advertising continue to grow despite the economic downturn. Online advertising continues to expand at a rate of more than 10% per year, with sales from online advertising exceeding $39.5 billion in 2012. Google's online ad revenues reached $36 billion in 2011. In addition to existing occupational and health laws requiring businesses to store employee chemical exposure data for up to 60 years, new federal security and accounting laws that mandate many businesses to keep email messages for five years are driving the estimated annual growth of digital information at a rate of 5 exabytes, or 37,000 new Libraries of Congress.

What's New In Management Information Systems

Lots! The constant advancement of technology, management's use of it, and its effects on corporate performance make management information systems the most fascinating issue in business. Old industries and companies go away, while new ones emerge. Successful enterprises are those who adopt the newest technology. The emergence of the mobile digital platform, the expansion of "big data" in business, and the rise of "cloud computing," where increasingly more commercial software is operated through the Internet, are three interconnected shifts in the technology sector. Smartphones and tablets like the iPhone, iPad, BlackBerry, and Android are more than simply devices for entertainment. They stand for fresh, developing computing platforms built on a variety of novel hardware and software innovations.

Technology

Platform for cloud computing is becoming a significant source of commercial innovation. Tasks that were formerly completed by corporate computers are now being carried out by a flexible network of computers on the Internet. The majority of business applications are provided as an Internet service online.

Huge Data

Large amounts of data from Web traffic, emails, social media posts, and machine data are used by businesses to get insights. These data must be captured, stored, and analyzed using modern data management systems. In order to compete with the PC as a business system, a mobile digital platform is created. Thousands of programs for teamwork, location-based services, and communication with coworkers may be downloaded on the Apple iPhone and Android mobile devices. Smaller laptops are being challenged as platforms for consumer and business computing by devices like the iPad, Google Nexus, and Kindle Fire.

Management

Google Apps, Google Sites, Microsoft Windows SharePoint Services, and IBM Lotus Connections are used by more than 100 million business professionals worldwide to support blogs, project management, online meetings, personal profiles, social bookmarks, and online communities. Managers adopt online collaboration and social networking software to improve coordination, collaboration, and knowledge sharing. Business intelligence tools help managers make better decisions by accelerating more sophisticated data analyses and interactive dashboards that provide real-time performance statistics.

Organizations

Telework is becoming more popular in the workplace because to the Internet, wireless laptops, cellphones, and mobile computers, which enable an increasing number of individuals to work remotely. In the United States, 55% of companies provide some kind of remote work program. Business computing is increasingly shifting from PCs and desktop computers to these mobile devices. These tools are being used more often by managers to organize tasks, interact with staff members, and give information for making decisions. These advancements are referred to as the "emerging mobile digital platform".

DISCUSSION

Online collaboration and social technologies are often used by managers to speed up and improve decision-making. The way that work is structured, coordinated, and assessed changes as managerial behavior does. The social network connects workers working on teams and projects, which is where work is done, plans are carried out, and managers oversee. Even when they are separated by countries and time zones, workers may interact in collaboration spaces. Organizations are able to depend increasingly on dispersed decision-making, telework, and remote work thanks to the power of cloud computing and the expansion of the mobile digital platform. Due to the same platform, businesses are able to outsource more work and depend more on markets to create value. Additionally, it implies that businesses may work with clients and vendors to develop fresh items or improve upon current ones [5]–[7].

Some of these patterns may be seen in action during the interactive management session. The mobile digital platform is extensively used by millions of managers to organize suppliers and shipments, please clients, and oversee personnel. It would be impossible to do business without these mobile devices or connection to the Internet. As you read this example, pay attention to how the newly developed mobile platform significantly improves the precision, swiftness, and depth of decision-making.

A Flattened World: Globalization Challenges and Opportunities

Columbus confirmed in 1492 what astronomers had long believed: that the globe was round and that the oceans could be navigated safely. As it turned out, there were many differences in

the economic and technological advancement of the many peoples and languages that made up the world's population. These peoples and civilizations are now more closely related because to the global commerce that followed Columbus' expeditions. The "industrial revolution" was really a global phenomenon spurred on by increased international commerce. The globe is now "flat," according to writer Thomas Friedman, who said in an acclaimed book published in 2005. He meant that the Internet and international communications had significantly lessened the economic and cultural advantages of developed nations. According to Friedman, highly educated, motivated people in low-wage regions of the less developed globe are competing with the U.S. and European nations for employment, markets, resources, and even ideas. For businesses, this "globalization" offers both benefits and disadvantages.

The United States' economy and the economies of other sophisticated industrial nations in Europe and Asia are increasingly dependent on imports and exports. In 2012, imports and exports from other countries accounted for more than 33% of the U.S. GDP. In both Europe and Asia, the percentage was more than 50%. Many Fortune 500 American companies get half of their income from international operations. For instance, sales of Intel's microprocessors abroad accounted for 85% of the company's income in 2011. Eighty percent of the toys sold in the US are produced in China, although around 90% of the PCs created there utilize Intel or Advanced Micro Design processors developed in the US. Not just products traverse international boundaries. Jobs also change, some of which are high-level, well-paying positions that need a college degree. The United States lost many million industrial jobs in the last ten years to low-wage, offshore workers.

Mouth of Your Hand

Can you manage your business entirely with your hands? Maybe not totally, but there are a lot of tasks that an iPhone, iPad, BlackBerry, or other mobile portable device can handle nowadays. Because of its high security features, ability to access internal corporate systems, and optimization for email and messaging, the BlackBerry used to be the preferred mobile device for business. That is now altering. Both big and small businesses are beginning to use Android and Apple's iPhone and iPad to carry out more of their operations. They are strengthening their security measures to enable mobile users to securely access private company resources from a distance.

These mobile devices have proven indispensable to certain people. Champion kayaker Eric Jackson spends half of each year traveling throughout North America to compete and attend tournaments. Additionally, he serves as president of Jackson Kayak, the foremost producer of whitewater kayaks. He must participate in sporting events, keep an eye on market trends, and speak with dealers and customers face-to-face. With distributors on six continents, Jackson's tremendous global expansion has been aided by his strong commitment to his customers. Jackson claims that he can manage the full 120-person firm from a distance using the iPhone and iPad. Jackson's RV has wireless Internet access, and it can link to the corporate headquarters in Sparta, Tennessee. Jackson utilizes the 3G mobile connection on his iPad when he isn't connected to Wi-Fi. He has immediate access to every aspect of his business thanks to the iPad, allowing him to review new designs, update website content, or analyze client statistics. Jackson's iPad has all the tools this executive needs to connect with the home office, dealers, and consumers, including calendars, e-mail, and contact management, the capacity to generate and edit documents, spreadsheets, and presentations.

Managers and staff members at Jackson Kayak found both the iPad and iPhone to be quite useful. To ensure he is ordering the right components, Chief Operations Officer John Ratliff may use an iPad to compare photographs of replacement parts with pictures of Jackson Kayak's

production equipment at the facility. The iPhone and iPad have proven so indispensable that the business has given iPhones to every employee, including those in customer service, design, and quality control. Many people also own iPads.

Not just small businesses use handhelds to manage their operations. One of the biggest corporations in the world, General Electric manufactures a variety of products, including generators, turbines, lights, electric distribution and control systems, locomotives, laundry and kitchen appliances, and diagnostic imaging devices. Aside from technology for the healthcare industry, GE is a top supplier of financial services, aviation, renewable energy, and media. This enormous multinational was a pioneer in the use of mobile technologies. Employees at GE may access electronic presentations, contacts, documents, and email on their iPads. Numerous iPhone and iPad apps have been created by GE's Mobile Center of Excellence, including business intelligence tools that assist decision-makers in identifying patterns and trends in massive amounts of data as well as industry-specific diagnostic and monitoring tools. With the ability to zoom in from a global map to an individual transformer and view all of the essential performance data, the company's Transformer Monitoring app assists in managing gas turbine inventories and electronic transformers all over the globe. Service employees may monitor railroad lines and get diagnostic data on locomotives using a PDS Movement Planner.

With operations in 60 nations, Dow Corning provides more than 7,000 goods and services for commercial and domestic use, including lubricants, adhesives, and solids, liquids, gels, and powders. Dow Corning executives can easily examine and evaluate real-time data from their primary business system, including sales figures, trends, and estimates, using the Roambi Visualizer app on their iPhones. It provides managers with straightforward, understandable dashboards for complicated data. Don Sheets, executive vice president and chief financial officer, claims that he can determine if there is a financial performance problem that requires his involvement in less than 15 seconds. The XIAMETER brand of standard silicone goods are tracked by Dow Corning's Analytics App for the iPhone, which keeps track of online sales and site visits. Google Analytics and the Analytics App are connected. Executives can keep track of which material is and isn't being utilized when Dow Corning launches XIAMETER Web sites throughout the world, whether they are at home, on the road, or at work.

With a $2 billion rental equipment inventory, Sunbelt Rentals, located in Fort Mill, South Carolina, is one of the biggest equipment rental businesses in the US. More than 1,200 firm employees use iPhones to communicate with contacts and keep track of events on their calendars, including sales representatives, field workers, and executives. Sunbelt implemented a proprietary application called Mobile SalesPro, which integrates many systems and databases into a unified package for the sales force, in addition to utilizing iPhones for email, scheduling, and contact management [8]–[10]. This program combines data from several different company processes and links the enterprise system, the corporate point-of-sale system, and the inventory control and management system. Based on the most recent data on rental prices and equipment availability, users may discuss sales estimates. The sales staff at Sunbelt will be able to quickly reply to client inquiries while on a project site thanks to this application.

An Upending Digital Firm

The circumstances for a completely digital business have been established as a result of all the changes we just discussed and an equally major organizational overhaul. There are various ways to describe a digital corporation. A digital company is one where almost all of the organization's key business contacts with clients, partners, and staff are enabled and mediated digitally. Digital networks that cover the whole enterprise or connect different businesses enable core business functions. The collection of logically connected actions and behaviors

that businesses build over time to generate certain business outcomes, as well as the particular way in which these actions are structured and coordinated, are referred to as business processes. Business processes include making and completing orders, planning marketing campaigns, employing staff members, and developing new products. How well a firm handles its business processes may determine its competitive advantage.

Digital tools are used to manage the main company assets, including intellectual property, core competencies, financial resources, and human resources. Any information needed to support important business choices is always accessible in a digital corporation, regardless of location. Digital businesses notice and react to their surroundings far more quickly than conventional businesses, offering them greater adaptability to endure in unstable times. Digital businesses have remarkable chances for more adaptable worldwide organization and administration. Both time and spatial moving are typical in digital businesses. Time shifting is the practice of doing business constantly, around-the-clock, as opposed to just within the 9 a.m. "work day" timeframe to 5 p.m. Working inside national borders and in a worldwide workshop are both examples of space shifting. Wherever in the globe it is best achieved, work is done physically.

Numerous businesses are on the verge of becoming digital businesses that rely entirely on the Internet, including Cisco Systems, 3M, and IBM. The majority of other businesses aren't totally digital yet, but they're working toward tight digital integration with suppliers, clients, and staff. For instance, many businesses are switching over to "virtual" meetings employing videoconferencing and web conferencing technologies in place of conventional face-to-face meetings.

Information Systems' Strategic Business Objectives

Why are information systems so important in today's world? Why do firms spend so much money on technology and information systems? More than 154 million employees and over 21 million managers in the US depend on information technologies to run their businesses. In the United States and the majority of other modern nations, information systems are crucial for running everyday company operations and accomplishing long-term corporate goals.

Without significant investments in information technologies, whole sectors of the economy are all but impossible. Simply said, companies involved in e-commerce like Amazon, eBay, Google, and E*Trade would not exist. Without information systems, today's service sectors—finance, insurance, and real estate, as well as personal services like travel, healthcare, and education—could not function. Similar to how industrial companies like General Motors and General Electric need information systems to thrive, retail companies like Walmart and Sears also depend on them. Information technology is a cornerstone for business in the twenty-first century, much as offices, telephones, file cabinets, and effective tall buildings with elevators were once the foundations of business in the twentieth century.

The ability of a company to employ information technology and its capacity to carry out corporate strategy and accomplish corporate objectives are becoming more interdependent. The capabilities of a company's systems frequently determine what it can do in the next five years. Market share growth, low-cost production, new product development, employee productivity growth, and more are all increasingly dependent on the types and caliber of information systems in a business. The more you are aware of this link, the more useful a manager you will be. Business organizations spend a lot of money on information systems to accomplish six strategic business goals: operational excellence, innovative goods, services, and business models; close relationships with customers and suppliers; better decision-making; competitive advantage; and survival.

The dependency between a company's information systems and its business capabilities is rising in modern systems. Changes in hardware, software, databases, and telecommunications are becoming more and more necessary to accommodate changes in strategy, regulations, and business processes. What the organization can accomplish relies often on the capabilities of its systems.

Excellence in Operations

Businesses are always looking for ways to make their operations more efficient in order to increase profitability. One of the most crucial tools managers have at their disposal for increasing productivity and efficiency in corporate operations is the use of information systems and technology, particularly when combined with modifications to management style and business practices.

The world's biggest retailer, Walmart, is an example of how information technologies may be used in conjunction with smart business strategies, supportive management, and world-class operational efficiency. Walmart's Retail Link technology, which digitally connects its suppliers to each of its shops, helped it record $460 billion in sales in fiscal year 2012 nearly one-tenth of all retail sales in the United States.

The supplier watching the item is alerted to dispatch a replacement to the shelf as soon as a buyer purchases it. Walmart outperforms its nearest rival, Target, in terms of retail shop efficiency, with sales of more than $28 per square foot as opposed to $23 for Target. Producing less than $12 per square foot are other retailers.

CONCLUSION

In conclusion, in today's corporate environment, information systems are essential because they provide firms with effective data management, increased decision-making skills, and operational effectiveness. Businesses may acquire a competitive advantage and react to the One of the most crucial tools managers have at their disposal for increasing productivity and efficiency in corporate operations is the use of information systems and technology, particularly when combined with modifications to management style and business practices. The world's biggest retailer, Walmart, is an example of how information technologies may be used in conjunction with smart business strategies, supportive management, and world-class operational efficiency.

Walmart's Retail Link technology, which digitally connects its suppliers to each of its shops, helped volatile market climate by wisely using technology and data. Although information systems have many benefits, their installation calls for careful design, money, and ongoing maintenance. To guarantee effective acceptance and use, organizations must take into account aspects including system compatibility, scalability, security, and user training.

REFERENCES

[1] Y. Hasan Al-Mamary, A. Shamsuddin, and N. Aziati, “The Role of Different Types of Information Systems In Business Organizations□: A Review,” *Int. J. Res.*, 2014.

[2] Legesse Lemma Chuma, “The Role of Marketing Information Systems on Business Firms Competitiveness: Integrated Review Paper from Business Perspective,” *J. Mark. Consum. Res.*, 2020, doi: 10.7176/jmcr/72-01.

[3] N. Z. M. Sari, A. Susanto, N. N. Afiah, M. Sueb, and H. Suharman, “Supply chain quality accounting information systems with business strategy effective in BUMN Bandung Indonesia,” *Int. J. Supply Chain Manag.*, 2019.

[4] Meiryani, Y. Lisanti, M. Heykal, and D. Wahyuningtias, "Usefulness of accounting information systems for businesses," *Syst. Rev. Pharm.*, 2020, doi: 10.31838/srp.2020.12.313.

[5] R. Amin, "Innovations in Information Systems for Business Functionality and Operations Management," *ABC Res. Alert*, 2019, doi: 10.18034/abcra.v7i3.546.

[6] N. Bajgoric, "Reengineering business information systems to support business continuity," *Int. J. Bus. Contin. Risk Manag.*, 2018, doi: 10.1504/IJBCRM.2018. 090581.

[7] D. Bourgeois, J. Mortati, S. Wang, and J. Smith, "Information Systems for Business and Beyond (2019)," *Bioinforma. Tools Appl.*, 2019.

[8] D. Lipaj and V. Davidavičienė, "Influence of information systems on business performance," *Moksl. – Liet. ateitis / Sci. – Futur. Lith.*, 2013.

[9] J. Y. L. Thong, "An integrated model of information systems adoption in small businesses," *J. Manag. Inf. Syst.*, 1999, doi: 10.1080/07421222.1999.11518227.

[10] S. Kelly, N. Gibson, C. P. Holland, and B. Light, "Focus Issue on Legacy Information Systems and Business Process Change: A Business Perspective of Legacy Information Systems," *Commun. Assoc. Inf. Syst.*, 1999, doi: 10.17705/1cais.00207.

CHAPTER 3

EXPLORING THE DEVELOPMENT OF NEW PRODUCT AND BUSINESS MODELS

Mr. Anil Gowda
Associate Professor, Masters in Business Administration,
Presidency University, Bangalore, India.
Email Id: anilbgowda@presidencyuniversity.in

ABSTRACT:

In the ever-evolving business landscape, the development of new products, services, and business models is essential for organizations to remain competitive and meet the changing needs of consumers. This abstract provides an overview of the importance, characteristics, and benefits of new product development, service innovation, and companies with millions of physical and online clients, the challenge is how to really know your suppliers or customers. High-end hotels like The Mandarin Oriental in Manhattan and others are good examples of how information systems and technology are used to create close relationships with customers. These hotels utilize computers to keep track of their visitors' preferences, including desired room temperature, check-in time, frequently called phone numbers, and television shows. creation of novel business models. New product development is a strategic process through which organizations introduce innovative offerings to the market. It involves identifying opportunities, conducting market research, conceptualizing ideas, designing prototypes, testing, and launching new products. By continuously innovating and introducing new products, organizations can attract customers, increase market share, and achieve sustainable growth.

KEYWORDS:

Artificial Intelligence (AI), Block chain, Crowdfunding, Customer-Centric, Data-Driven, Digital Disruption, E-Commerce.

INTRODUCTION

Information technology and systems are a key enabler for businesses to develop novel goods and services as well as completely new business models. A business model explains how a corporation manufactures, provides, and sells a product or service in order to make money. The music business of today is quite different from that of ten years ago.

An outdated music distribution strategy based on vinyl records, cassettes, and CDs was converted by Apple Inc. into an online, legal distribution one based on its own iPod technological platform. Apple has benefited from a steady line of iPod advancements that have given rise to products like the iPad, iPhone, and iTunes music service [1]–[3].

Client and Supplier Closeness

When a company treats its customers well and gets to know them well, the consumers often reciprocate by coming back and spending more. Profits and sales rise as a result. Similar principles apply to suppliers: the more actively a firm interacts its suppliers, the more able they are to offer essential inputs. Costs drop as a result. For companies with millions of physical and online clients, the challenge is how to really know your suppliers or customers.

High-end hotels like The Mandarin Oriental in Manhattan and others are good examples of how information systems and technology are used to create close relationships with customers. These hotels utilize computers to keep track of their visitors' preferences, including desired room temperature, check-in time, frequently called phone numbers, and television shows. They then store this information in a sizable data bank. In order to provide remote monitoring and control, each hotel room is networked to a main network server computer.

Based on the guest's digital profile, the system adapts the room settings when they check in at one of these hotels, such as lowering the lights, adjusting the temperature, or playing the right music. In order to pinpoint their ideal clients and create customized marketing efforts based on their tastes, hotels also examine their guest data.

The advantages of supplier intimacy afforded by information technologies are best shown by JCPenney. Every time a dress shirt is purchased at a JCPenney location in the US, a record of the transaction is promptly recorded on computers at the supplier, TAL Apparel Ltd., a contract manufacturer that makes one in every eight dress shirts purchased in the US. The amount of replacement shirts to produce, along with their designs, colors, and sizes, are all decisions made by TAL after running the numbers through a computer model it created. The shirts are then delivered by TAL to each JCPenney location, fully avoiding the retailer's warehouses. In other words, both the cost of holding and the inventory of shirts at JCPenney are almost nothing [4]–[6].

Improved Decision Making

Many corporate managers work in an information fog bank, seldom having access to the appropriate data at the appropriate moment to make wise decisions. Instead, managers depend on predictions, educated guesses, and good fortune. As a consequence, there is an imbalance in the production of products and services, inefficient resource allocation, and slow reaction times. These disappointing results drive up expenses and drive away business. Information systems and technological advancements over the last ten years have enabled managers to make choices based on real-time market data.

For instance, Verizon Corporation, one of the biggest telecommunications firms in the US, uses a Web-based digital dashboard to give managers precise real-time information on customer complaints, network performance for every locality served, and line outages or storm-damaged lines. Managers may use this information to quickly assign repair personnel to impacted locations, notify customers of repairs being made, and quickly restore service.

Competitive Benefit

Companies are likely to have gained a competitive edge when they accomplish one or more of these business goals: operational excellence; innovative goods, services, and business models; supplier/customer intimacy; and enhanced decision-making. bigger sales and bigger profits that your rivals cannot match come from doing things better than your competitors, pricing less for quality items, and reacting to consumers and suppliers immediately. Because they understand how to employ information systems for this goal, companies like Apple Inc., Walmart, and UPS who are discussed later in this are industry leaders.

DISCUSSION

Survival

Due to the need of information systems and technology for doing business, corporate organizations also invest in them. These "necessities" may sometimes be caused by

developments at the industry level. For instance, to compete with Citibank, other financial institutions hurried to provide ATMs to their clients when Citibank debuted the first automated teller machines in the New York area in 1977. This was done to entice consumers with improved service levels. Nearly all banks in the United States have regional ATMs now, and many of them are connected to both domestic and foreign ATM networks, such CIRRUS. Simply said, offering ATM services to retail banking clients is essential to operating and thriving in the sector. Numerous laws and rules at the federal and state levels impose obligations on businesses and their staff to keep records, including digital data. For instance, the dangerous Substances Control Act mandates that businesses keep data on employee exposure for 30 years and restricts the exposure of American employees to more than 75,000 dangerous substances. The Sarbanes-Oxley Act mandates that certified public accounting firms that audit public businesses keep all audit working papers and documents, including all emails, for five years. This requirement was put in place to increase the accountability of public companies and their auditors. Numerous additional federal and state laws governing health care, financial services, education, and privacy protection place stringent restrictions on U.S. companies regarding information retention and reporting. In order to give the capacity to address these difficulties, businesses turn to information systems and technology [7]–[9].

A View from Information Systems

Information systems and technologies have so far been used informally without any definition of the terminology. Information technology includes all of the hardware and software that a company has to employ to accomplish its business goals. This comprises software, such as the Windows or Linux operating systems, the Microsoft Office desktop productivity suite, and the many thousands of computer applications that may be found in a typical big company. It also includes computer hardware, such as computers, storage devices, and portable mobile devices. Because they are more complicated, "information systems" are best understood by considering them from both a technological and commercial standpoint.

An Information System Is What

Technically speaking, an information system is a collection of interconnected parts that gather, process, store, and disseminate data to assist decision-making and control inside an organization. Information systems may aid managers and employees in issue analysis, the visualization of complicated concepts, and the development of new products in addition to supporting decision making, coordination, and control. Information systems hold data about relevant people, locations, and objects either within the firm or in its immediate surroundings. By "information," we mean data that has been transformed into something that can be understood and used by people. The opposite of ordered information is data, which consists of streams of unorganized facts that describe events that take place in organizations or the physical environment.

It would be helpful to provide a small example that contrasts information with data. Millions of bits of information from bar codes, which characterize each product, are scanned at supermarket checkout counters. The total number of bottles of dish detergent sold at a specific store, the brands of dish detergent that were selling the fastest there or in their sales territory, or the total amount spent on that brand of dish detergent there can all be totaled and analyzed to provide meaningful information. The information required by firms to make choices, manage operations, evaluate issues, and develop new goods or services is produced through three activities in an information system. Input, processing, and output are these actions. Raw data is captured or collected via input from both within and outside the company. This raw input gets processed into a useful form. The processed information is sent to the users or the

activities for which it will be utilized via output. In order to analyze or improve the input stage, information systems also need feedback, which is output that is sent back to the right individuals of the organization.

For instance, the raw input for Disney World's systems for managing crowds consists of information from airline and hotel reservations, satellite weather data, historical attendance data for the analysis date, and crowd images from video cameras positioned at strategic points throughout the park. These data are stored in computers, which then use them to compute the anticipated overall attendance for a given day as well as the attendance and wait times for each ride and restaurant at different times during the day. The mechanisms that determine which rides or attractions are too busy, which have more capacity, and which may be expanded. The system offers useful data like the quantity of Raw data from a supermarket checkout counter can be processed and arranged to produce useful data like the total amount of dish detergent sold in units or the total amount of revenue from dish detergent sales for a particular store or sales territory.

Information about a company and its surroundings may be found in an information system. The information that businesses require is produced by three fundamental processes: intake, processing, and output. Feedback is output that is sent to the right individuals or groups inside an organization so they may assess and improve the input. Customers, suppliers, rivals, shareholders, and regulatory agencies are examples of environmental actors that communicate with the company and its information systems.

There is a clear distinction between a computer and a computer program on the one hand, and an information system on the other, even if computer-based information systems employ computer technology to convert raw data into useful information. Modern information systems' technological underpinnings, resources, and tools are electronic computers and accompanying software. The tools for storing and processing information are provided by computers. Sets of operational instructions, often known as computer programs or software, are what guide and regulate computer processes. Designing solutions to organizational issues requires an understanding of how computers and computer programs operate, yet computers are just one component of an information system.

A suitable comparison is to a home. Hammers, nails, and wood are used to build houses, yet they alone do not constitute a home. The house's architecture, design, location, landscaping, and all of the choices that went into its development are essential in addressing the issue of providing a place for one to live. The hammers, nails, and lumber of computer-based information systems are computers and programs, but by alone, they are unable to provide the information that a given organization requires. Information systems must be understood in terms of the issues they are intended to address, their architectural and design components, and the organizational procedures that result in these answers.

Information System Dimensions

You must comprehend information systems' larger organizational, managerial, and information technology facets as well as their capacity to address challenges and issues in the corporate environment if you want to completely comprehend them. Information systems literacy is the term we use to describe this larger understanding of information systems, which includes knowledge of both the managerial and organizational aspects of systems as well as their technical aspects. Contrarily, computer literacy places a greater emphasis on understanding information technology.

This greater information systems literacy is what the area of management information systems strives to attain. The creation, usage, and effect of information systems utilized by managers and staff inside the company are dealt with by MIS, which also addresses technical and behavioral difficulties related to these topics. Let's look at the organizations, management, and information technology aspects of information systems individually.

Organizations

Organizations can't function without their information systems. Indeed, without an information system, certain businesses, like credit reporting agencies, couldn't function. An organization's major components include its personnel, structure, operational procedures, political environment, and cultural norms. These organizational components are introduced here, and their further descriptions can be found. Understanding the structure, management, and information technology that shape the systems is necessary for using them efficiently. As an organizational and managerial response to environmental difficulties, an information system adds value for the company.

Organizational structures are made up of many levels and expertise. Their organizational systems show a definite separation of work. In a commercial organization, authority and responsibility are arranged in a hierarchy or pyramid structure. Employees in management, professional, and technical roles make up the hierarchy's top levels, while operational staff makes up its bottom levels. Senior management oversees the company's financial performance in addition to making long-term strategic choices concerning the goods and services it offers. Senior management's programs and plans are carried out by middle management, while operational management is in charge of keeping an eye on the company's day-to-day operations. While data employees, such as secretaries or clerks, help with scheduling and communications at all levels of the company, knowledge workers, such as engineers, scientists, or architects, build goods or services and generate new information for the company. Employees in the production or service industries really make the product and provide the service.

Professionals are hired and educated for a variety of commercial tasks. Sales and marketing, production, finance and accounting, and human resources are among the primary business services that are carried out by business companies goes into further depth about these commercial operations and how information systems assist them.

Work is coordinated by an organization's hierarchy and business processes, which are logically connected tasks and actions for carrying out work. Business procedures include things like creating a new product, completing an order, and recruiting new personnel. Most businesses have formal standards for carrying out activities that have been created over a lengthy period of time. These guidelines provide direction to employees while doing a range of tasks, from creating an invoice to handling client complaints. While some of these business procedures are technically codified, others are informal work habits, such as the need to answer calls from customers or colleagues. Many corporate procedures are automated by information systems. For instance, an information system that combines a number of formal business procedures often determines how a client gets credit or how a customer is invoiced.

Every organization has a distinct culture, or underlying set of beliefs, ideals, and methods of operation, which the majority of its members have come to embrace. Look around your institution or college to observe organizational culture at work. The fundamental beliefs of university life include the notions that professors are more knowledgeable than students, that learning is the main goal of college, and that courses run on a set timetable. Information systems inside an organization almost usually include elements of its culture. For instance, UPS places

a high focus on customer service, which is reflected in the organizational culture of the firm and its package tracking systems, which are covered in more detail.

Different interests and points of view are produced by the various levels and expertise within an organization. These opinions often diverge on how to manage the business and how to allocate resources and incentives. Organizational politics are built on conflict. All companies naturally have conflicting viewpoints, compromises, and agreements that result in information systems.

Management

It is the responsibility of management to make sense of the many circumstances that organizations encounter, to make choices, and to create plans of action to address organizational issues. Managers identify environmental business concerns, establish organizational strategies to address those difficulties, and assign the people and financial resources needed to successfully coordinate the effort. They must demonstrate responsible leadership at all times. The goals, dreams, and realities of managers in the actual world are reflected in the corporate information systems discussed in this book. But managers need to do more than just oversee what is already in place. They must sometimes re-create the organization as well as develop new goods and services. Creative labor fueled by fresh knowledge and information makes up a significant portion of managerial responsibilities. When managers are refocusing their enterprises and developing new goods and services, information technology may be a great tool. 12 goes into great length on management decision-making.

Technology Information

One of the numerous instruments managers employ to adapt to change is information technology. The physical tools utilized for input, processing, and output operations in an information system are known as computers. It comprises of multiple input, output, and storage devices, as well as telecommunications equipment that connects the various computers. It also includes computers of different sizes and designs. The intricate, preprogrammed instructions that manage and coordinate the computer hardware elements in an information system make up computer software.

The different components of hardware are connected together via networking and telecommunications technology, which consists of both hardware and software to move data between physical locations. Networks may link computers and communication devices to share speech, data, pictures, music, and video. To exchange information or resources, like a printer, a network connects two or more computers. The Internet is the biggest and most popular network in the world. With approximately 2.3 billion users in more than 230 countries, the Internet is a worldwide "network of networks" that connects millions of diverse networks using common standards.

A new "universal" technological platform has been produced by the Internet, which may be used to develop new goods, services, tactics, and business models. Internally, the company may utilize the same technological platform to connect various systems and networks by using it. Intranets are internal company networks powered by Internet technologies. Extranets are private intranets that are made available to authorized users outside the company. Businesses use these networks to coordinate their interactions with other businesses when making purchases, working on designs together, and doing other interorganizational tasks. Utilizing Internet technology is both a business need and a competitive advantage for the majority of commercial organizations today.

The World Wide Web is a service offered by the Internet that employs globally recognized standards for the storage, retrieval, structuring, and presentation of data on the Internet in a page format. Web pages connect to other Web sites and include text, pictures, animations, sound, and video. You may connect to related pages to get more information and links to other Web sites by clicking on highlighted words or buttons on a Web page. New types of information systems, like UPS's Web-based package tracking system illustrated in the next Interactive Session, may be built on the Web.

The information technology infrastructure of the company is made up of all of these technologies, the personnel needed to operate and manage them, and other resources that may be shared throughout the organization. The company may construct its own information systems on top of the foundation, or platform, provided by the IT infrastructure. To have the set of technology services it need for the task it intends to do using information systems, each business must carefully plan and manage its IT infrastructure. S. 5 through S. 8 of this book cover each significant technological element of information technology infrastructure and demonstrate how they all interact to produce the organization's technological foundation.

Some of the common technologies utilized in today's computer-based information systems are described in the Interactive Session on Technology. To increase the effectiveness of its operations and focus on its customers, UPS heavily invests in information technology. It employs a variety of information technologies, including as bar code scanning devices, wireless networks, powerful mainframe computers, portable computers, the Internet, and several software programs for tracking deliveries, determining fees, managing client accounts, and managing logistics. Let's list the components of the UPS package tracking system's administration, structure, and technology. The organizational component firmly roots UPS's sales and manufacturing processes in the package tracking system. It outlines the specific steps that must be taken to identify packages with sender and destination information, take inventory, monitor the items as they travel, and provide UPS customers and customer support agents with package status reports.

Information must also be provided by the system to meet the demands of managers and employees. In order for UPS drivers to function successfully and efficiently, they must get training on both package pickup and delivery methods as well as how to utilize the package tracking system. Utilizing UPS's internal package tracking software or the UPS website may need some training for UPS clients. The management of UPS is in charge of keeping an eye on service levels, expenses, and pushing the company's low-cost, high-quality service combination strategy. The management made the decision to deploy computer systems to make it simpler to ship packages via UPS and to check on their arrival status, which would save delivery costs and boost sales revenues. Handheld computers, bar code scanners, desktop computers, wired and wireless communications networks, UPS's data center, package delivery data storage technology, UPS internal package tracking software, and software to access the World Wide Web make up the technology supporting this system. As a consequence, there is an information system that addresses the business problem of offering a high quality of service at competitive pricing.

A Business Perspective on Information Systems in "It Isn't Just Technology

Information technology and systems are investments made by managers and commercial organizations because they have a tangible economic benefit to the company. The choice to construct or operate an information system is predicated on the idea that the investment would provide better returns than alternative investments in machinery, buildings, or other assets. Increases in productivity, higher revenues, or even better long-term strategic positioning of the

company in certain markets are three ways that these greater returns will be communicated. We can see that an information system is a crucial tool for generating value for the company from a business standpoint. By delivering information that helps managers make better choices or that enhances the execution of business procedures, information systems allow the company to grow its revenue or minimize expenses.

Ups Contracts In a Global Information Technology Market

In a basement office no bigger than a closet, United Parcel Service had its start in 1907. UPS has successfully used this strategy for more than a century to become the greatest ground and air package-delivery firm in the world. Jim Casey and Claude Ryan, two youths from Seattle with two bicycles and one phone, made the promise of the "best service and lowest rates." It is a multinational company with approximately 400,000 people, 93,000 cars, and the ninth-largest airline in the world. Every day, UPS ships 15.6 million items and documents to the US and more than 220 other nations and territories. Due to significant investments in cutting-edge information technology, the company has been able to retain its leadership in small package delivery services despite fierce competition from FedEx and Airborne Express. UPS invests more than $1 billion annually to keep costs down and streamline its entire operations while maintaining a high level of customer service.

Everything begins with the package's scannable bar-coded label, which includes specific information about the sender, the recipient, and the expected delivery date. Using special UPS software or by visiting the UPS website, customers may download and print their own labels. Information from the "smart" label is transferred to one of UPS's computer centers in Mahwah, New Jersey, or Alpharetta, Georgia, and routed to the distribution facility closest to the shipment's eventual destination before the delivery is ever picked up. This center's dispatchers receive the label data, then utilize specialized software to design each driver's most effective delivery route that takes into account traffic, weather, and the location of each stop.

According to UPS, this technology allows its delivery vehicles to travel 28 million less miles and use 3 million fewer gallons of gasoline annually. Drivers are taught to apply "340 Methods" created by industrial engineers to improve the execution of every activity, from lifting and loading boxes to choosing a product from a shelf in the truck, in order to further boost cost savings and safety. Every day, a delivery information system (DIS) portable computer is the first item a UPS driver takes up. Accessing a wireless mobile network using an acquisition device. The driver's daily route is downloaded into the handheld as soon as they log on. The DIAD also automatically records pickup and delivery details as well as client signatures. Then, for storage and processing, UPS's computer network receives the package tracking information. From there, the data may be

Be accessible from anywhere in the globe to provide consumers evidence of delivery or to address any inquiries. When a motorist hits "complete" on the DIAD, the updated information often appears on the Web in less than 60 seconds. UPS can keep an eye on shipments throughout the delivery process and even reroute them using its computerized package tracking system. Bar code readers scan the shipping information on the package label at several stops along the path from sender to recipient, feeding information about the item's movement into the main computer. From desktop computers connected to the central computers, customer support agents may monitor the progress of any package and reply to queries from clients right away. Customers of UPS may also get this information using their own computers or mobile devices to browse the company's website. For owners of iPhone, BlackBerry, and Android smartphones, UPS now provides mobile applications and a mobile Web site.

Anyone who has a box to send may use the UPS website to monitor goods, look up delivery routes, figure out shipping costs, estimate how long a product will take to travel, print labels, and arrange for a pickup. The information gathered at the UPS website is sent to the UPS central computer for processing before being returned to the consumer. Additionally, UPS offers tools so that clients, like Cisco Systems, may integrate functions from UPS, such tracking and cost estimations, into their own websites. This allows clients to follow shipments without having to go to the UPS website.

International service orders and inventories for the fulfillment of vital components are managed via a web-based post-sales order management system. The system enables high-tech electronics, aerospace, medical equipment, and other companies anywhere in the world that ship critical parts to quickly evaluate their critical parts inventories, choose the best routing option to satisfy customer needs, determine the best time to place online orders, and follow the progress of their parts from the warehouse to the customer. Customers are informed of each shipment milestone and may be notified of any changes to the flight itineraries for commercial planes transporting their components thanks to an automated e-mail or fax function. Now, UPS is using its decades of experience running its own international delivery network to oversee logistics and supply chain operations for other businesses. It established a subsidiary called UPS Supply Chain Solutions, which offers whole packages of standardized services to paying businesses at a fraction of the price of developing their own systems and infrastructure. In addition to logistics services, these services also include supply chain design and management, freight forwarding, customs brokerage, postal services, multimodal transportation, and financial services.

UPS began managing the pharmaceutical and medical device industries' supply networks in 2006. For instance, 4,000 orders for insulin pumps and other supplies are filled daily by company pharmacists at the UPS headquarters in Louisville, Kentucky, from clients of Medtronic Inc., a Minneapolis-based medical equipment firm. UPS pharmacists in Louisville access the Medtronic system, complete the orders using the inventory on hand, and coordinate UPS delivery of the devices to patients. By using UPS's service, Medtronic was able to shut its own distribution facility and drastically cut the price of handling each order. giants like UPS and other package transportation businesses are spending significantly [10]–[12].

CONCLUSION

In conclusion, for firms to succeed in a changing business environment, the creation of new goods, services, and business models is essential. Organizations may seize new possibilities, adapt to changing consumer requirements, and experience sustained success by embracing innovation.

Organizations may generate value, set themselves apart from rivals, and lay the groundwork for long-term success by adopting a methodical and customer-focused strategy. The creation of novel goods, services, and business strategies is not without difficulties, however. Investment, risk-taking, and the capacity for managing uncertainty are necessary. Market circumstances must be properly examined, feasibility must be determined, and resource allocation must be efficient. Additionally, excellent marketing tactics, strong leadership, continual review, and improvement are necessary for the successful adoption of new services.

REFERENCES

[1] P. K. Kukkamalla, A. Bikfalvi, and A. Arbussa, “The new BMW: business model innovation transforms an automotive leader,” *J. Bus. Strategy*, 2020, doi: 10.1108/JBS-02-2020-0021.

[2] J. Weking, M. Stöcker, M. Kowalkiewicz, M. Böhm, and H. Krcmar, "Leveraging industry 4.0 – A business model pattern framework," *Int. J. Prod. Econ.*, 2020, doi: 10.1016/j.ijpe.2019.107588.

[3] I. S. Muslicha and I. Irwansyah, "INSTAGRAM DAN FENOMENA 'JASTIP' DI INDONESIA," *J. Commun. Spectr.*, 2020, doi: 10.36782/jcs.v9i1.1871.

[4] A. Urbinati, D. Chiaroni, V. Chiesa, and F. Frattini, "The Role of Business Model Design in the Diffusion of Innovations: An Analysis of a Sample of Unicorn-Tech Companies," *Int. J. Innov. Technol. Manag.*, 2019, doi: 10.1142/S0219877019500111.

[5] S. Kim and H. Park, "Effects of various characteristics of social commerce (s-commerce) on consumers' trust and trust performance," *Int. J. Inf. Manage.*, 2013, doi: 10.1016/j.ijinfomgt.2012.11.006.

[6] A. S. Yusuf, A. R. Che Hussin, and A. H. Busalim, "Influence of e-WOM engagement on consumer purchase intention in social commerce," *J. Serv. Mark.*, 2018, doi: 10.1108/JSM-01-2017-0031.

[7] E. Drejeriene and R. Drejeris, "Systematic approach to a new service ideas conceptualisation: Quantitative decision making," *Eng. Econ.*, 2017, doi: 10.5755/j01.ee.28.3.14752.

[8] D. M.-S. Kleber, "Design Thinking for Creating an Increased Value Proposition to Improve Customer Experience," *ETIKONOMI*, 2018, doi: 10.15408/etk.v17i2.7311.

[9] A. Ordanini and A. Parasuraman, "Service innovation viewed through a service-dominant logic lens: A conceptual framework and empirical analysis," *J. Serv. Res.*, 2011, doi: 10.1177/1094670510385332.

[10] S. Azadi and E. Rahimzadeh, "Developing Marketing Strategy for Electronic Business by Using McCarthy's Four Marketing Mix Model and Porter's Five Competitive Forces," *EMAJ Emerg. Mark. J.*, 2012, doi: 10.5195/emaj.2012.25.

[11] A. Viljakainen, M. Toivonen, and A. Seisto, "Digitalisation and service business model innovation in media," *J. PRINT MEDIA Technol. Res.*, 2016.

[12] P. M. F. Teberga and F. L. Oliva, "Identification, analysis and treatment of risks in the introduction of new technologies by start-ups," *Benchmarking*, 2018, doi: 10.1108/BIJ-06-2017-0156.

CHAPTER 4

COMPLEMENTARY ASSETS: ORGANIZATIONAL CAPITAL AND THE RIGHT BUSINESS MODEL

Ms. Pramoda Hegde
Assistant Professor, Masters in Business Administration,
Presidency University, Bangalore, India.
Email Id: pramodah@presidencyuniversity.in

ABSTRACT:

Complementary assets, including organizational capital and the right business model, are essential components for leveraging and maximizing the value of innovations in today's business landscape. This abstract provides an overview of the significance, characteristics, and benefits of complementary assets in driving organizational success. Organizational capital refers to the intangible assets within an organization that enable it to effectively utilize and leverage its resources, capabilities, and knowledge. These assets encompass elements such as organizational culture, leadership, employee skills, collaborative networks, and organizational processes. By cultivating a strong organizational capital, businesses can enhance their ability to innovate, adapt to change, and create value.

KEYWORDS:

Core Competencies, Customer Relationships, Distribution Channels, Intellectual Property, Knowledge Management, Licensing Agreements, Network.

INTRODUCTION

We can better understand why some businesses get better outcomes from their information systems than others by being aware of the organizational and management aspects of information systems. Studies of the returns from investments in information technology reveal that there is a wide range in the returns that organizations obtain. Some businesses invest a lot and make a lot of money, whereas others invest the same amount and make little money. Others contribute little and get a lot in return, while others put in little and get a lot. This implies that financial success is not always guaranteed by investing in information technology. What causes this variance across firms?

The notion of complementary assets holds the key to the solution. Only when combined with supporting organizational principles, structures, and behavior patterns can information technology investments increase the effectiveness of companies and managers. Before businesses can really benefit from new information technology, they must modify the way they do business. Some businesses either choose to maintain an outdated business model that is doomed by new technology or fail to embrace the correct business model that matches the new technology. For example, record label businesses resisted switching to a new online distribution model in favor of sticking with their existing business strategy, which was built on the distribution of music via physical music shops. As a consequence, Apple Computer, a technological business, dominates the legal internet music market rather than record label.

The assets needed to get value out of a main investment are called complementary assets. For instance, significant supplementary expenditures in highways, roads, petrol stations, repair facilities, and a legal regulatory system to establish standards and oversee drivers are necessary to extract value from autos [1]–[3].

According to research, companies that invest in complementary assets to their technology investments, such as new business models, processes, management styles, organizational cultures, or training, see superior returns. Conversely, companies that don't make these complementary investments see little to no return on their information technology investments. Organizational and management capital is another name for these investments in organization and management. Businesses must make significant complementary expenditures in order to reap the benefits of their information technology investments. A portion of this investment involves material possessions like structures, equipment, and tools. However, complementing investments in management and organization have a significant role in determining the return of information technology investments.

A competent information system development team, an acceptable business model, effective business processes, decentralization of power, highly dispersed decision rights, and a supportive corporate culture that prioritizes efficiency and effectiveness are important organizational complementary investments. Strong senior management support for change, incentive systems that track and reward individual creativity, a focus on cooperation and collaboration, training programs, and a management culture that values flexibility and expertise are important managerial complementary assets.

The Internet and the culture that supports it, educational systems, network and computing standards, rules and laws, and the existence of technology and service companies are all significant societal investments. We highlight an analytical framework that takes into account organizational, managerial, and technological assets as well as their relationships throughout the whole book. The book's most significant message one that is perhaps reflected in case studies and exercises is that managers must take into account the larger organization and management aspects of information systems in order to comprehend current issues and to realize above-average returns on their investments in information technology. As you will see throughout the article, companies who can handle these linked IT investment aspects are often well-compensated.

DISCUSSION

Contemporary Approaches to Information Systems

Information system research spans several academic disciplines. There is no dominant theory or viewpoint. The primary disciplines that contribute to the challenges, difficulties, and solutions in the study of information systems. Technical and behavioral techniques might be used to categorize the area in general. Sociotechnical systems include information systems. Even though they are made up of "hard" physical technology like equipment and gadgets, they need significant social, organizational, and intellectual expenditures to function successfully.

Technical Strategy

The technical approach to information systems places a strong emphasis on the formal capabilities and physical technology of these systems, as well as mathematically based models for studying information systems. Computer science, management science, and operations research are the fields that support the technological approach. The goal of computer science is to develop theories of computing, computational techniques, and methods for effective data access and storage. The creation of models for decision-making and management practices is emphasized in management science. Operations research focuses on quantitative methods for enhancing certain organizational factors, including transportation, inventory management, and transaction costs.

Behavioral Strategy

The study of behavioral problems that come up during the creation and ongoing maintenance of information systems is a significant component of the area of information systems. With the models used in the technical approach, issues such strategic business integration, design, execution, usage, and management cannot be effectively investigated. Important thoughts and techniques are contributed by other behavioral sciences.

For instance, sociologists examine information systems with an eye on how people, groups, and organizations influence system development as well as how systems impact these entities. Psychologists are interested in how people make decisions and interpret and utilize formal information, thus they research information systems. With a focus on understanding the creation of digital products, the dynamics of digital marketplaces, and how new information systems alter the control and cost structures inside the enterprise, economists research information systems. The behavioral strategy takes into account technology. Information systems technology is, in fact, often the cause of a behavioral issue or problem. However, this strategy typically does not place much emphasis on technical fixes. Instead, it focuses on adjustments to behavior, management, and organizational policy.

This Text's Approach: Sociotechnical Systems

Suppliers of hardware and software, business firms investing in the technology and looking to gain value from it, managers and employees looking to maximize corporate value, and the current legal, social, and cultural context all play major roles in the book's rich story. These players work together to create what are known as management information systems.

The study of management information systems was developed to concentrate on how businesses and government organizations utilize computer-based information systems. With a focus on managing information technology resources and finding system solutions to real-world issues, MIS integrates the work of computer science, management science, and operations research. It also addresses the behavioral difficulties that surround the creation, application, and effects of information systems, subjects that are generally covered by sociology, economics, and psychology. We have learned from our experiences as academics and practitioners that no one method adequately represents the reality of information systems. Informational achievements and failures are seldom either technological or exclusively behavioral. Understanding the views of many disciplines is the finest advise we can provide to pupils. The topic of information systems is really challenging and exciting since it requires an understanding of and tolerance for a wide range of methodologies. The sociotechnical view of systems is the best way to describe the perspective we use in this book. According to this theory, achieving the best organizational performance involves simultaneously improving the social and technological systems that are employed throughout production [4]–[6].

Avoiding a solely technological approach to information systems is made easier by adopting a sociotechnical systems viewpoint. As an example, the fact that information technology is fast becoming more affordable and powerful does not always or readily transfer into increased productivity or bottom-line profitability. An enterprise-wide financial reporting system may have just been deployed by a company, but that does not guarantee that it will be utilized or used well. Also, if a company hasn't made any investments in new information systems to support its newly implemented business procedures and processes, it doesn't always follow that workers will be more productive.

In this book, we emphasize the significance of enhancing overall business performance. Attention must be paid to both the behavioral and technological aspects. This calls for adapting

and designing technology to meet both corporate and personal demands. To achieve this fit, the technology may sometimes need to be "de-optimized". For instance, mobile phone users customize this technology to suit their unique demands, which prompts manufacturers to act rapidly to modify the technology to meet customer expectations. Through training, organizations and people must also be altered. According to a sociotechnical viewpoint, a system's performance is optimal when both the organization and the technology mutually adapt to one another until a suitable fit is achieved.

Practical MIS Projects

With the help of the projects in this area, you'll get practical experience in analyzing issues with inventory and financial reporting, utilizing data management software to enhance management decisions about growing sales, and using the Internet to look for job needs.

Problems with management decisions

1. For the majority of its data collection and reporting, Snyders of Hanover's finance department used spreadsheets and manual procedures. The company sells around 80 million bags of pretzels, snack chips, and organic snack products annually. The last week of each month, the financial analyst at Hanover would be tasked with gathering spreadsheets from the leaders of more than 50 different departments throughout the globe. Then, she would compile and Put all the information back in the spreadsheet that will be used to create the company's monthly profit and loss statement. The analyst had to return the original spreadsheet, wait for the department to resubmit its data, and then finally submit the new data in the consolidated document if a department required to change its data after sending the spreadsheet to the main office. Analyze how this event may affect company performance and management choices.

2. The Dollar General Corporation runs deep-discount shops with packaged food, apparel, cleaning products, housewares, and other goods, the majority of which are sold for only one dollar. Cost-cutting is essential to their business strategy. The business uses a manual system to monitor the inventory at each location. When a delivery truck pulls up, managers know roughly how many cases of a certain product they should get, but the shops lack the equipment to scan the cases or check the item count inside of them. Losses of goods due to theft or other accidents have been increasing and currently account for over 3% of total sales. Before investing in an information system solution, what choices must be made Software expertise: database reporting and querying Commercial expertise: sales trend analysis

In this project, you will begin with raw transactional sales data and create queries and reports using Microsoft Access database software to assist managers in making better choices about product pricing, sales promotions, and inventory replenishment. A Store and Regional Sales Database created in Microsoft Access may be found in MyMISLab. The database provides unprocessed information on weekly computer equipment retail sales in different sales areas. The database has entries for the following information: the store identification number, the sales area, the item number, the item description, the unit price, the number of units sold, and the week during which the sales were made. To make this information more practical for operating the firm, create some reports and queries using Access.

Visit a website that lists jobs, like Monster.com. Visit the website and spend some time looking at the positions in accounting, finance, sales, marketing, and human resources. Find two or three job descriptions that include the use of information systems. What information systems expertise are needed for these positions? What must you do to be ready for these positions? Summarize your results in a one- or two-page report.

Vhs Cases

There are accessible video cases and instructional videos that illustrate some of the ideas in this. To view these videos, get in touch with your teacher.

Teamwork And Collaboration Project

The personal assistant is a motorcyclist who is always available to conduct any errands for either private individuals or businesses. The most frequent services they provide include paying bills, serving as a courier, and purchasing groceries or other items from retailers. The key to Mashaweer's success is their flexibility, and they frequently receive odd requests that they have fulfilled in order to win over customers. Examples include: going to the gym to tell someone to answer the phone as someone is trying to reach them, delivering gifts to a client's fiancée every 15 minutes, and carrying a client's shopping bags from the car to the house. Mashaweer is a crucial service for Egyptians because of the country's widespread traffic issues, which make it difficult for people to do many errands on the same day. In Alexandria and Cairo, where traffic is a problem, Mashaweer's business has found great success by helping individuals save one of the most important commodities: time. The service allows customers to spend more time with their loved ones or friends while not having to worry about anything.

Of the regular errands that often eat up half a day. They also serve as a security or safety precaution since they do errands for people at dangerous moments, such the aftermath of a revolution or just after dark. The majority of people cannot afford to hire a full-time helper to do their errands as required. Each person receives a full-time helper from Mashaweer for a part-time expense. Mashaweer began operations in Alexandria in 2010 and has since expanded to Cairo, where it now processes around 600 orders daily. They want to increase and improve the services they provide while also expanding geographically inside Egypt and to other nations in the area. Mohamed Wahid came up with the concept for Mashaweer, which he later co-founded with his business colleagues Ahmed El Kordy and Aly El Shazly. All of them spent their early years in Alexandria. Mohamed Wahid and Ahmed El Kordy

Met when they both moved to IGCSE Academy for high school from various schools. In two years, Ahmed El Kordy completed high school, and in 2008, he graduated from The Arab Academy of Science and Technology with a bachelor's degree in industrial engineering. He spent a year studying abroad at Carleton University in Ottawa, Canada, as part of his undergraduate degree. Throughout the summer Ahmed completed many internships in the UK and Ireland throughout his undergraduate studies. Mohamed Wahid attended AAST as well and earned a bachelor's degree in construction engineering in 2009. Aly El Shazly completed his education at St. Marks School. He then transferred to Alexandria University to pursue a business degree, where he received his diploma in 2007. Ahmed El Kordy began working for his father's import-export company after graduating from college. After founding X-trade, a business for trade and contracting, Mohamed Wahid moved on to start Green Media, a business for marketing and advertising. In addition to serving as vice-chairman of Green Towers, a real estate company with a net value of around $16 million, he is now a major stakeholder in both.

While getting ready for his wedding, Wahid had the inspiration to found Mashaweer. When his future wife's list of errands became too long for her to handle in a short period of time, he began to wonder what she would have done if she couldn't afford to hire a full-time driver to do all of her errands for her. He started considering how much time people may save and what a vital service it might be while on his honeymoon, so he made the decision to contact his pals to begin turning the concept into a real business plan. The three business owners agreed to go on with the real construction of this company after creating a business strategy. As the need for the service developed, they naturally expanded from their modest beginnings. The three

business owners each contributed $5,000 to the endeavor, for a beginning capital of $15,000 overall. They just had 3 bikes, 6 riders, and a hotline when they first began.

The three friends decided they wanted to advance to the next stage by creating Mashaweer in Cairo after they understood they had genuinely succeeded in Alexandria. They made the decision to use an entirely different approach when they wanted to expand to Cairo. From the outset, they intended to be able to reach Greater Cairo as a whole, not just certain neighborhoods. They started doing market research to develop in Cairo and began making significant investments during the Revolution in January 2011. They made numerous sizable purchases for pennies on the dollar, including motorbikes and advertising space, since business had ceased to exist across the nation. Others viewed it as a chance to calm down, but the business owners saw it as a chance to start promoting their company. By March, they had come to the conclusion that they would have to raise their initial outlay in order to expand enough to control the Cairo market. To achieve this, they enlisted the help of other investors, mostly friends and family, who helped them expand the initial investment to $1.67 million. They determined that their competitive edge would have to be investing in technology in order to enter Cairo with full force and create a high barrier of entry for any competitors. They wanted to purchase an ERP system, but the prices were out of their price range. To address this, they founded Innov8, an information technology business, where they developed a bespoke ERP system that they linked to their custom PDAs using a cloud computing system provided by LinkDotNet and Mobinil. The PDA, which also has a GPS to offer precise instructions, distributes chores one at a time to each rider. The rider's position is tracked via the GPS.

Mashaweer doesn't use outsourcing in any of its phases to save costs or guarantee quality as long as it can do the task with the same or better quality. This is why Mashaweer established Innov8 to develop its platform and oversee its technological operations. Mashaweer is now merely a partial owner of this business and one of its many customers. The contact center at Mashaweer is another illustration of its own capabilities. After turning down many proposals for an external contact center, the corporation decided that having one on staff was preferable. This was done in order to keep an eye on the agents' performance and always strive to raise the bar on their customer service. Using CISCO, which supports up to 300 IP phones, a reporting module, and a recording system, together with an innovative contact center made it much simpler for Mashaweer to monitor its incoming calls and address any issues that could be encountered by its customer service agents [7]–[10]. The Mashaweer ordering system may be integrated with other systems via the API. This creates several opportunities for company growth by enabling third parties to automate their delivery process and integrate Mashaweer into their current CRM/dispatching systems.

Each example PDA has the Mashaweer PDA program loaded, which controls the following elements: monitoring the development of your Order fees and other expenditures are collected through a printed invoice. its kind in Egypt when it was originally created, it completely dominated the market for such a service. However, the market was unaware of or unaccustomed to such a service, so it began to expand gradually in Alexandria until people understood and were acclimated to the concept that a firm existed that could do your duties. In contrast, the business expanded rather quickly once it began operating in Cairo. Numerous aspects are anticipated to have an impact on the target market and make it simpler for Mashaweer to enter it aggressively. People first assume that utilizing Mashaweer is overly opulent and expensive. This view changes after their first few uses, and individuals start to depend on this practical service. A cultural shift that results from increased use of the service has a big impact on how much demand there is for it.

The daily developments in technology are another element that is predicted to improve working conditions and save expenses. Mashaweer, which relies significantly on technology instruments, would profit from further technological breakthroughs and price reductions. As a consequence, Mashaweer's overall expenses will go down, allowing it to lower its rates and improve its quality so that it is even more practical for more people. The only business in Egypt that works on this scale is Mashaweer. But following Mashaweer's success in Alexandria, a firm by the name of Wassaly was founded in Cairo. This company runs on a much smaller scale. Other courier services are one of their indirect rivals. In contrast to other couriers on the market today, they have positioned themselves as flexible couriers and provide same-day delivery in lieu of next-day delivery. Other businesses find it extremely challenging to compete with Mashaweer because of its several advantages:

Being the first in the market and the first of its type are the two key components. The versatility of their service, which caters to all of their customers' wants and wishes, is another crucial distinction. Mashaweer has made significant investments in the systems they utilize, unlike new competitors or imitators in the industry. Because PDAs give data like GPS tracking to track each order and the position or stage the courier is placed, they invested in them to allow the operations process to be monitored correctly. Because the messenger is connected to an automated system and gets his assignments through a PDA portable, Mashaweer uses this technology to reduce the quantity of mistakes. To monitor all live orders and gauge traffic during rush hours, a SCADA system will be accessible at Mashaweer headquarters. This will allow the operation team to respond and take a preventive and corrective action.

CONCLUSION

In conclusion, Utilizing and maximizing the value of innovations requires the combination of complementary assets, such as organizational capital and the appropriate business strategy. Organizations may efficiently use their resources, capture value, and achieve long-term success by building a strong organizational capital and matching it with the appropriate business model. In today's dynamic business environment, firms may stimulate innovation, adapt to change, and create a competitive edge by embracing complementary assets. Nevertheless, creating and using complementary assets is not without difficulties. It requires investment, constant review, and strategic planning.

Organizations must promote a culture of ongoing learning, promote cross-functional cooperation, and make infrastructure and technology investments. The ideal business model also has to have a thorough awareness of market trends, client wants, and the capacity to adjust to changing business situations.

REFERENCES

[1] J. H. Lin and M. Y. Wang, “Complementary assets, appropriability, and patent commercialization: Market sensing capability as a moderator,” *Asia Pacific Manag. Rev.*, 2015, doi: 10.1016/j.apmrv.2014.12.013.

[2] A. Arora and M. Ceccagnoli, “Patent protection, complementary assets, and firms’ incentives for technology licensing,” *Manage. Sci.*, 2006, doi: 10.1287/mnsc.1050.0437.

[3] A. Taylor and C. E. Helfat, “Organizational linkages for surviving technological change: Complementary assets, middle management, and ambidexterity,” *Organ. Sci.*, 2009, doi: 10.1287/orsc.1090.0429.

[4] J. Ge and T. Li, “Entrepreneurial resources, complementary assets, and platform sustainability,” *Sustain.*, 2019, doi: 10.3390/su11164359.

[5] F. T. Rothaermel, "Incumbent's advantage through exploiting complementary assets via interfirm cooperation," *Strateg. Manag. J.*, 2001, doi: 10.1002/smj.180.

[6] S. Steinhauser, C. Doblinger, and S. Hüsig, "The Relative Role of Digital Complementary Assets and Regulation in Discontinuous Telemedicine Innovation in European Hospitals," *J. Manag. Inf. Syst.*, 2020, doi: 10.1080/07421222.2020.1831778.

[7] C. Woo, Y. Chung, D. Chun, and H. Seo, "Exploring the impact of complementary assets on the environmental performance in manufacturing SMEs," *Sustain.*, 2014, doi: 10.3390/su6107412.

[8] B. Wu, Z. Wan, and D. A. Levinthal, "Complementary assets as pipes and prisms: Innovation incentives and trajectory choices," *Strateg. Manag. J.*, 2014, doi: 10.1002/smj.2159.

[9] Y. C. Chiu, H. C. Lai, T. Y. Lee, and Y. C. Liaw, "Technological diversification, complementary assets, and performance," *Technol. Forecast. Soc. Change*, 2008, doi: 10.1016/j.techfore.2007.07.003.

[10] X. Zhou, "A Review of Complementary Assets," *Am. J. Ind. Bus. Manag.*, 2019, doi: 10.4236/ajibm.2019.99116.

CHAPTER 5

BUSINESS PROCESSES AND INFORMATION SYSTEMS

Dr. Yagnamurthy Raja
Assistant Professor, Masters in Business Administration,
Presidency University, Bangalore, India.
Email Id: narasimharaja@presidencyuniversity.in

ABSTRACT:

Business processes and information systems are interconnected elements that are integral to the efficient functioning and success of modern organizations. This abstract provides an overview of the relationship between business processes and information systems, highlighting their importance, characteristics, and the benefits they offer to businesses. Business processes refer to the structured and coordinated activities within an organization that are designed to achieve specific goals and deliver value to customers. These processes encompass a range of activities, such as product development, procurement, production, sales, customer service, and financial management. Effective business processes enable organizations to streamline operations, improve productivity, and enhance customer satisfaction. A key company objective is to provide outstanding service. The management thinks that in order to accomplish this aim, effective cooperation and employee learning are essential. At TELUS, traditional classroom settings outside of the corporation were where the majority of employee learning took occurred until recently.

KEYWORDS:

Automation, Business Analysis, Business Intelligence, Business Process Management (BPM), Cloud Computing, Data Management.

INTRODUCTION

Employee learning was heavily reliant on instructors' information presentations, which was a costly learning strategy. Management came to the conclusion that employees would benefit more by sharing knowledge. Furthermore, TELUS needed to establish a variety of methods to share and preserve employee expertise and knowledge since 40% of the company's personnel was projected to retire within the next 10 years. The business made the decision to concentrate on fostering "continuous, collaborative, and connected" social and informal learning among team members by using mentorship, coaching, job rotations, videos, blogs, and wikis. TELUS allocated $21 million for learning in 2010, 40% of which was for casual and social learning and 60% for formal learning. In order to support the new learning strategy, TELUS has made use of Microsoft SharePoint Server 2010, which gives team members a single point of access to shared knowledge across the organization and the capacity to simultaneously search all of the organization's learning materials.

TELUS gave team members the ability to design their own Web sites that highlight their specialties and areas of experience using the SharePoint My Sites feature. Team members may interact with coworkers and join informal groups with individuals who have complementary abilities. They can also view their positions and those of others in the corporate structure. A feature called Expert Search offers ranked search results that show TELUS workers who are knowledgeable in certain fields. For team members to create their own blogs and contribute to those of others, My Sites also provides blogging facilities. Through these blogs, a team member

may identify an expert, connect with him or her, exchange tips, and find out information without attending a class or interrupting a colleague [1]–[3].

TELUS created My Communities team sites using SharePoint so that departments, project teams, and other organizations could collaborate and share documents and other material. They have the ability to set up classification and labelling schemes for user-generated material. Members of the team may submit and watch user-generated videos of their professional successes or queries on TELUS Tube. The number of videos uploaded exceeds 1,000. Team members may monitor and show the formal learning courses they have attended as well as the courses that other team members have done thanks to a new learning management system that tightly integrates with SharePoint Server 2010.

TELUS understood that changing from formal education to knowledge acquisition via employee engagement and collaboration needed a change in business culture. Dan Pontefract, Senior Director of Learning at TELUS, said, "This is not a circumstance in which we can turn a switch and have everyone alter their work habits overnight. The business developed a wiki to stimulate employee conversation and put up an internal site showcasing practical examples of the new collaboration tools to promote acceptance of and involvement in the new social learning processes. In order to assist team members get ready for the move, Pontefract shares information about the new learning program on his blog.

TELUS team members no longer need to wait for the next formal learning session because of the new SharePoint system's much quicker access to the exact skills and knowledge areas where they need assistance. Instead, team members may quickly get in touch with colleagues who are knowledgeable in a particular field, read blogs and wikis, watch videos, and engage in conversations to obtain the answers they need. The 2010 TELUS learning budget was lowered to $21 million by the use of SharePoint. The following year, as it continued its move to informal and social learning, the corporation was able to reduce this spending by 20%. As the new learning solutions catch on, further cost reductions will be realized. In the three-year strategy of TELUS, formal education will only account for 50% of the whole learning spending.

The management of TELUS determined that using new technology would be the ideal way to transition from a formal learning environment to one where team members collaborated and learned from one another. As a corporate platform for collaboration, knowledge acquisition, and knowledge transfer, the organization adopted Microsoft SharePoint Server 2010 and made use of the new "social" technologies to encourage employee participation and cooperation. For a large portion of staff learning and problem-solving, TELUS currently uses its internal workplace social network, and SharePoint incorporates all methods of formal training courses, podcasts, blogs, wikis, videos, and corporate social networking. The corporation has cut expenses and is able to share institutional knowledge more efficiently.

DISCUSSION

Businesses must deal with a wide variety of information in order to function, including data on their goods and services, customers, workers, invoices, and payments. In order to function effectively and improve the overall performance of the company, they must plan work activities that make use of this information. Businesses can manage all of their information, make better choices, and enhance the execution of their business operations thanks to information systems.

Processes In Business

We defined business processes as the way that work is planned, synchronized, and concentrated in order to generate an excellent product or service. The series of tasks necessary to create a

product or service are known as business processes. The participants in business processes exchange materials, information, and expertise to support these operations. Business processes can refer to the particular ways that organizations organize work, information, and expertise as well as the methods used by management to do it.

The effectiveness of a company enterprise is largely dependent on how effectively its business operations are planned and orchestrated. If a company's business procedures allow it to innovate or perform better than its competitors, they may be a source of competitive strength. Business procedures that are based on antiquated methods of operation that limit organizational responsiveness and effectiveness may potentially be liabilities. Many of the other instances in this work, as well as the opening case demonstrating TELUS's advances in employee learning procedures, amply demonstrate these ideas.

Every firm may be seen of as a set of interconnected business processes, some of which are components of more comprehensive overall processes. For instance, the total knowledge management process includes the use of mentorship, wikis, blogs, and videos. A certain functional area is connected to a lot of business operations. For instance, the sales and marketing department is in charge of locating clients, while the human resources department is in charge of recruiting personnel. Other business procedures involve departmental collaboration and span across several distinct functional domains. Consider the ostensibly straightforward commercial procedure of completing a client purchase. The sales division first gets a sales order. The order initially goes to accounting for a credit check or a request for quick payment before shipment to make sure the client can pay for the purchase. The manufacturing division either creates the goods or removes it from inventory after the customer's credit has been established. After then, the item is delivered. The accounting division produces a bill or invoice, and a notification that the goods has delivered is given to the client. Following notification of the shipment, the sales team is ready to assist the client by returning calls or taking care of warranty requests.

A complicated series of procedures are involved in fulfilling a client order, and they call for careful coordination between the production, accounting, and sales departments. Fulfilling an order, which at first glance seems like a straightforward business operation, really involves a complex web of business procedures that call for careful coordination across key functional areas inside a company. Furthermore, a lot of information is needed in order to effectively complete each of these phases in the order fulfillment process. Rapid information exchange is necessary between decision makers inside the company, with business partners like delivery services, and with customers. This is made feasible by computer-based information systems.

Information Technology and Business Process Improvement

In what specific ways can information systems enhance company procedures? Many procedures in company operations that were formerly done manually, such confirming a client's credit or creating an invoice and shipping order, are now automated by information technology. However, modern information technology is far more capable. In fact, new technology has the potential to alter the way information is shared and accessed, allowing for the simultaneous completion of several activities in place of sequential ones and the elimination of decision-making delays. The way a firm operates is regularly altered by new information technology, which also enables whole new business models. Without today's information technology, it would be impossible to download a Kindle e-book from Amazon, purchase a computer online from Best Buy, or download a song from iTunes. These are all completely new business processes based on new business models [4]–[6].

Due to this, it is crucial that you focus on business processes throughout your information systems course and throughout your career. You may get a very clear grasp of how a firm operates by studying its business procedures. Additionally, by doing a business process analysis, you'll learn how to alter the company by enhancing its operations to make it more productive or efficient. Through the course of this book, we'll look at company processes to see how they may be enhanced by information technology for better productivity, creativity, and customer service.

Information System Types

Now that you are familiar with business processes, it is time to take a closer look at how information systems assist a firm's business operations. There are several types of systems since there are various interests, specialties, and levels within an organization. No one system can provide all the information a company need. Every main business function sales and marketing, manufacturing and production, finance and accounting, and human resources is supported by systems in a typical company organization. The Learning Tracks for this provide examples of systems for each of these business functions. Functional systems that work separately from one another are becoming obsolete because it is difficult for them to communicate information to enable cross-functional business activities. Large-scale cross-functional systems that combine the operations of linked business processes and organizational units have replaced many of them. Later in this section, we will explain these integrated cross-functional applications. In a normal company, many systems are in place to assist the various management groups' demands in terms of decision-making. Systems are used by operational management, middle management, and senior management to support the choices they must make to operate the business. Let's examine these structures and the kinds of choices they encourage.

Computer Systems for Various Management Groups

Systems are in place in a corporate organization to support various management levels or groups. Systems for business information and systems for transaction processing are among them.

Systems for Processing Transactions

Systems that monitor basic organizational operations and transactions, such sales, revenues, cash deposits, payroll, credit decisions, and the movement of commodities in a plant, are necessary for operational managers. These kinds of data are provided by transaction processing systems. A computerized system known as a "transaction processing system" (TPS) executes and documents the everyday administrative tasks required to run a firm, such as sales order input, hotel bookings, payroll, personnel record keeping, and shipping. Systems at this level primarily serve to monitor the movement of transactions through the organization and provide routine answers to enquiries. How many components are on hand? What became to Mr. Smith's compensation? Generally speaking, material must be readily accessible, up to date, and correct to be able to answer these types of queries.

Tasks, resources, and objectives are set and highly organized at the operational level. For instance, a lower-level supervisor decides whether to provide credit to a client based on predetermined criteria. The customer's eligibility is the only thing that has to be established. 2.2 shows a TPS for processing payroll. The money given to workers is tracked by a payroll system. A single transaction for this system is an employee time sheet that includes the name, social security number, and amount of hours worked each week. As soon as this transaction is entered into the system, it changes the master file, which is the organization's ongoing repository for personnel data. The system's data are integrated in various ways to provide

reports useful to management and governmental organizations as well as to pay personnel. TPS is necessary for managers to keep track of the state of internal operations and the company's interactions with the outside world. TPS are also significant information generators for other systems and corporate operations. For instance, the general ledger system of the business, which is in charge of keeping track of the company's revenue and spending and creating reports like income statements and balance sheets, receives data from the payroll system. Additionally, it provides employee payment history data to the company's human resources department for use in calculating insurance, pensions, and other benefits, as well as employee payment data to governmental organizations like the U.S. both Social Security and the Internal Revenue Service

Administration

Because transaction processing systems are often so essential to a company's operations, their temporary failure might spell the end for a company and even other businesses connected to it. Think about what would happen if UPS's shipment tracking system broke down! Without their computerized reservation systems, what would airlines do Employee payment transaction data is captured by a TPS for payroll processing? Online and printed reports for management and employee paychecks are among the system outputs. In the Interactive Session on Technology, it is discussed how malfunctioning automated baggage handling systems affect airline travel. Try to identify the transactions being handled as you read this example, and consider how the data produced by these systems affects company performance.

Business intelligence systems

Businesses also use business intelligence systems, which give data to help managers make decisions. The word "business intelligence" refers to the organization, analysis, and dissemination of data and software tools that enable managers and other corporate users to make better choices. All management levels have decision-making demands, which are met by business information. We defined management information systems as the study of information systems in business and management. Business intelligence systems for middle management support monitoring, regulating, decision-making, and administrative tasks. A particular class of information systems servicing middle management is sometimes referred to as management information systems. Middle managers may get information from MIS on the organization's present performance. Future performance is predicted using this data, which is also utilized to monitor and manage the firm.

MIS use information provided by transaction processing systems to summarize and report on the company's fundamental activities. Increase capacity from 40 to 70 million bags; lower cost per bag without lengthening wait times. The fundamental transaction data from TPS are compressed and often displayed in reports that are published on a regular basis. The majority of the work concerned the enormous Schiphol luggage conveyor network, which consists of 9,000 storage capacitors, 6 robotic units, and 21 kilometers of transport rails that operate as a single system. Additionally, given the geographical conditions around the airport, expanding the system with additional surfaces is not feasible. The objective of the luggage conveyor network is straightforward: the correct bag must arrive at the appropriate location and time.

The network must carry out numerous crucial tasks to achieve this purpose, including transporting luggage from the check-in area to the departure gate, transporting luggage from one gate to another, transporting luggage from the arrival gate to the baggage claim, and organizing and managing peripheral hardware and software. Additionally, a vast range of sensors, actuators, mechanical devices, and computers are used in these functions. Over 3 million lines of source code are used by the network. a few of Destination-coded trucks, automated bar code scanners, radio-frequency identification tags, and high-tech conveyors

fitted with sorting equipment are just a few examples of the cutting-edge technology employed in baggage handling systems. Prior to travelers, luggage should relocate from its present place to its final destination. The fact that everything has to be accessible and durable that is, work 99.99% of the time while being able to minimize loss or damage in the 0.01% of instances when it doesn't adds to the complexity.

The activities of the Schiphol luggage conveyor network are summed up in the straightforward scenario that follows. Your luggage are tagged when you get to the check-in counter. The tags include a barcode/RFID that all of the computers in the baggage handling system can read, along with information on your trip. Computers in the system scan the bar code or detect the RFID, analyze the data it contains, and decide where to deliver your bag based on the information it contains. Once scanned, the system remembers where your luggage is at all times. at any moment and has the ability to reroute it depending on three factors: the size, priority, and time of flight. Instantaneous embarkation bags are referred to as "hot" bags. While "cold" luggage is swiftly diverted away from the major "highway" lines and sent into different storage locations around the network, these are transferred right away to aircraft stands. Unmanned carts called DCVs can load and unload bags without slowing down. The rails on which these carts travel resemble small roller coasters.

Across the airport's major "highway" rails. To prevent congestion, hot/cold storage spaces and buffers are employed. Every bag in the system has a unique computer chip that tracks where it is, where it is going, and how long it will take to get there. The system may tailor the carts' itineraries to bring the bags that are required most urgently to their destinations as quickly as possible. The conveyors must be exceedingly exact in their placement of bags in order to deposit them where they are required at precisely the appropriate moment for optimal efficiency since DCVs travel quickly and do not completely stop to collect luggage. When luggage arrives at the gate, it enters a station for sorting where airline workers utilize computer terminals to route luggage to the appropriate aircraft. The system "reconciles" luggage with its owner, or verifies that the owner and the baggage are truly on the same aircraft, to ensure that baggage is not misplaced [7]–[10].

There are still a lot of things that may go wrong with this procedure, no matter how lovely and pleasant it may appear. What if the luggage has the wrong tags, for instance? What if the tag cannot be read? How about adjustments to the schedule? Imagine saving 0.1% of $2.5 billion. Although baggage handling systems may be quite expensive, if implemented effectively, they pay for themselves. That's a lot of cash! There are still issues with Schiphol's new luggage system. In order to conduct an investigation into drug smuggling, local police filed a special warrant in November 2012 that called for halting the trains at Schiphol. At the time, the international Hub was serving 140,000 travelers, and some of them experienced luggage loss. The voyage-estimating system of a major international shipping firm that delivers massive loads of coal, oil, ores, and completed goods is an intriguing, compact, yet effective DSS. The company competes for open market shipping contracts to transport general cargo and owns certain boats while chartering others.

A voyage-estimating system determines the financial and technical aspects of the expedition. Financial calculations take into account port charges, freight rates for different kinds of goods, and ship/time costs. Numerous elements, including ship cargo capacity, speed, port distances, fuel and water consumption, and loading patterns, are included in technical specifications.

The system may respond to queries like the one below: Which vessel should be allocated at what rate to optimize profits given a client delivery schedule and an offered freight rate? What speed will allow a certain vessel to maximize its profit while yet meeting its delivery deadline?

What is the best loading procedure for a ship headed towards the United States? from Malaysia, the west coast? The DSS created for this business is shown in 2.5. The system runs on a robust desktop computer and has a menu system that makes it simple for users to input data and retrieve information.

We recently discussed the voyage-estimating DSS, which primarily relies on models. The emphasis of other business intelligence systems is primarily on data extraction from vast amounts of data, making them more data-driven. For instance, Intrawest, the biggest ski operator in North America, gathers and keeps a lot of consumer information from its website, contact center, hotel reservations, ski resorts, and shops that rent out ski equipment.

To better focus their marketing initiatives, managers may utilize specialized tools to evaluate this data and assess the worth, income potential, and loyalty of each consumer. The corporation then e-mails video clips that would appeal to each category to promote more visits to its resorts. The method divides clients into seven categories based on needs, attitudes, and behaviors, ranging from "passionate experts" to "value-minded family vacationers."

A powerful PC powers this DSS. Managers that must create bids for shipping contracts use it every day. systems for business intelligence also cater to top management's demands in terms of decision-making. Senior managers want systems that concentrate on long-term trends and strategic challenges, both inside the company and in the external environment. They are worried about issues like: What will the state of employment be in five years? What are the long-term cost trends in the industry? What goods ought to we be producing in five years?

Systems for executive assistance assist top management in making these choices. They deal with non-routine judgments that call for discretion, analysis, and insight since there is no established process for finding a solution. Senior managers may easily utilize the ESS interface to see graphs and data from a variety of sources. Senior executives often get the information via a portal, which presents integrated, tailored business material through a Web interface. ESS are made to include information about outside factors, like as new tax regulations or rivals, but they also use consolidated data from internal MIS and DSS. Senior managers can see the data that is most important to them thanks to their filtering, compression, and tracking of vital data.

These systems increasingly include business intelligence analytics for trend analysis, forecasting, and "drilling down" to more precise data. For instance, the CEO of Leaner Health Products, the biggest private-label vitamin and supplement producer in the US, has an ESS that gives him a real-time view of the company's financial performance as indicated by working capital, accounts receivable, accounts payable, cash flow, and inventory on his desktop. The data is displayed as a digital dashboard, which shows graphs and charts of important metrics for operating a business on a single screen. Digital dashboards are a common tool for management decision-makers nowadays.

A digital dashboard often uses a single screen to convey thorough and precise information for decision-making. Managers may easily identify areas that need improvement with the aid of the graphical overview of important performance metrics.

Data-driven management is one of the benefits of modern business intelligence and analytics technologies, where decision-makers largely depend on the data and analytical tools at their disposal to inform their job. Executive dashboards and reports may instantly access high-level or comprehensive views of data collected at the production or sales floor level. Real-time management is it. The Interactive Session on Management shows how Procter & Gamble, a renowned company, uses information-driven management.

CONCLUSION

In conclusion, the interaction of business processes and information technology is essential to an organization's successful operation. Organizations may optimize their operations, improve decision-making, and gain a competitive advantage by combining well-designed processes with suitable information technologies. Embracing the interdependence of business processes and information systems gives firms the flexibility to innovate, adapt to the changing business environment, and expand sustainably. However, careful planning, investment, and continuing maintenance are needed to create and manage business processes and information systems. In addition to ensuring data security and integrity, organizations also need to offer staff with the necessary training and assistance. To guarantee that the systems and procedures continue to meet the organization's changing demands, constant evaluation and optimization are essential.

REFERENCES

[1] P. A. Millet, P. Schmitt, and V. Botta-Genoulaz, "The SCOR model for the alignment of business processes and information systems," *Enterp. Inf. Syst.*, 2009, doi: 10.1080/17517570903030833.

[2] E. Ahoa, A. Kassahun, and B. Tekinerdogan, "Business processes and information systems in the Ghana cocoa supply chain: A survey study," *NJAS - Wageningen J. Life Sci.*, 2020, doi: 10.1016/j.njas.2020.100323.

[3] H. Y. Kang, A. H. I. Lee, and Y. C. Chan, "An integrated fuzzy multi-criteria decision-making approach for evaluating business process information systems," *Mathematics*, 2019, doi: 10.3390/math7100982.

[4] Meiryani and Lusianah, "The influence of business process on accounting information system quality," *Pertanika J. Soc. Sci. Humanit.*, 2018.

[5] V. E. Van Reijswoud, H. B. F. Mulder, and J. L. G. Dietz, "Communicative action-based business process and information systems modelling with DEMO," *Inf. Syst. J.*, 1999, doi: 10.1046/j.1365-2575.1999.00055.x.

[6] G. M. Giaglis, "A taxonomy of business process modeling and information systems modeling techniques," *Int. J. Flex. Manuf. Syst.*, 2001, doi: 10.1023/A:1011139719773.

[7] R. Heinrich, P. Merkle, J. Henss, and B. Paech, "Integrating business process simulation and information system simulation for performance prediction," *Softw. Syst. Model.*, 2017, doi: 10.1007/s10270-015-0457-1.

[8] M. A. A. Pantazi and N. B. Georgopoulos, "Investigating the impact of business-process-competent information systems (ISs) on business performance," *Manag. Serv. Qual.*, 2006, doi: 10.1108/09604520610675739.

[9] J. Bicevskis and Z. Bicevska, "Business Process Models and Information System Usability," in *Procedia Computer Science*, 2015. doi: 10.1016/j.procs.2015.12.361.

[10] V. Weerakkody and W. Currie, "Integrating business process reengineering with information systems development: Issues & implications," *Lect. Notes Comput. Sci. (including Subser. Lect. Notes Artif. Intell. Lect. Notes Bioinformatics)*, 2003, doi: 10.1007/3-540-44895-0_21.

CHAPTER 6

FEATURES OF SYSTEMS FOR LINKING THE ENTERPRISE

Dr. Varsha Pratibha
Associate Professor, Masters in Business Administration,
Presidency University, Bangalore, India.
Email Id: varsha.ps@presidencyuniversity.in

ABSTRACT:

Systems for linking the enterprise, also known as enterprise integration systems, play a crucial role in connecting and integrating various components and functions within an organization. This abstract provides an overview of the significance, characteristics, and benefits of enterprise integration systems in enabling seamless communication and collaboration across the enterprise. Enterprises are complex entities comprised of diverse systems, departments, and stakeholders. Enterprise integration systems facilitate the exchange of information, data, and processes among these disparate systems, enabling them to work together harmoniously. These systems utilize a combination of technologies, standards, and protocols to bridge the gap between different systems, databases, applications, and platforms. You may be wondering how a firm can handle all the information in all these different sorts of systems after reading about all the many kinds of systems we just detailed. You could also be concerned about the expense of maintaining so many different systems. You may also question how managers and staff are able to coordinate their work across all of these many platforms and how information can be shared across them. In actuality, each of these queries is crucial for modern enterprises.

KEYWORDS:

Cloud Computing, Data Exchange, Enterprise Application Integration (EAI), Enterprise Architecture, Enterprise Service Bus (ESB), Integration Platforms, Interoperability.

INTRODUCTION

Business Applications

Integration of all the many systems in a corporation has proved to be quite difficult. Corporations are often built via a combination of smaller company acquisitions and regular "organic" expansion. Over time, organizations accumulate a variety of systems—the majority of them older and struggle to make them to "talk" to one another and function as a single corporate system. There are several approaches to this issue. Implementing enterprise applications, which are systems that transcend functional boundaries, concentrate on carrying out business operations across the corporate organization, and involve all levels of management, is one approach. By closely coordinating and integrating groupings of business operations, enterprise apps assist organizations in being more adaptable and productive. This allows them to concentrate on effective resource management and customer service [1]–[3].

Enterprise systems, supply chain management systems, customer relationship management systems, and knowledge management systems are the four main enterprise applications. Each of these enterprise apps combines a linked collection of operations and business procedures in order to improve organizational performance overall. The architecture for these enterprise applications includes procedures that cover the whole company and, in some circumstances, extend beyond the organization to customers, suppliers, and other important business partners.

Enterprise Systems Companies utilize enterprise systems, sometimes called enterprise resource planning systems, to combine sales and marketing, finance and accounting, manufacturing and production, and human resources business operations into a unified software system. A single comprehensive data repository has information that was previously dispersed across several systems and is accessible to many different portions of the organization. When a consumer puts an order, for instance, the order data immediately flow to other areas of the business that are impacted by them. The warehouse is prompted by the order transaction to choose the items and arrange for shipping. The warehouse notifies the manufacturer to restock whatever has run out. To submit the invoice, the accounting department is informed. One of the largest consumer products firms in the world, Procter & Gamble has 127,000 people working for 300 brands in 180 countries and $82 billion in sales in 2011. P&G often appears at or near the top of lists of the "most admired companies" due to its capacity to develop, promote, and market significant consumer goods brands. P&G's strong information technology and readiness to develop new IT innovations to preserve a competitive edge in its sector have been key contributors to the company's success.

In order to do this, P&G has set out to completely digitize all of its operations and radically alter how it collects, presents, and analyzes data. The P&G Global Business Services division is developing analytics expertise and implementing new analytical solutions including Business Sufficiency, Business Sphere, and Decision Cockpits while cutting expenses from other parts of the company. By adopting a system that enables executives to concentrate on rapid business choices using the most accurate data accessible at that specific moment, these solutions remove the time wasted discussing various data sets.

The answers are predicated on a change in how P&G utilizes data for decision-making at all levels of the organization, from CEOs to brand managers to entry-level workers. In P&G's previous decision-making process, reports were requested, data was collected, and then sent to the important decision-makers a few days or weeks later. The new approach is more immediate, with participants huddling together in person or through video and bringing in the appropriate expertise to address issues as they occur. There is a greater need for real-time data and analytics competence.

Launched in 2010, the Business Sufficiency initiative provides executives with estimates regarding P&G market share and other important performance metrics six to one year in advance. It is based on a number of analytical models that demonstrate what is currently occurring in the industry, why it is happening, and what steps P&G should take. The "why" models emphasize sales data at the national, territorial, product, and store levels as well as factors like advertising and consumer consumption, taking into account unique regional and national economic information. P&G may react to the forecasts by changing its price, promotion, and product mix, as shown by the "actions" in the table. For instance, each Monday, CEO Bob McDonald and his executive committee discuss the top product categories and geographical territories that account for 60% of sales. Sales and market share fluctuations are shown using data visualizations.

Executives would need more thorough data: Is a single, significant shop to blame for the decline in detergent sales in Germany? Is the store making fewer purchases across Europe or only in Germany? Because P&G increased pricing or reduced promotions, did a competitor gain market share, or are sales of the product category declining generally?

P&G's Business Sphere is an interactive system created to provide P&G's executives access to insights, trends, and opportunities while also inspiring them to pose targeted business queries that can be answered with data right away. The information on sales, market share, and

advertising expenditures necessary for these managers to make informed choices is physically surrounded by two enormous 32-foot by 8-foot concave display screens. Numerous thousands of algorithms and analytical models gather data, classifying it by nation, area, product line, store level, and other categories, and track patterns like consumer consumption and advertising reaction across various regions and nations. The same information is shown to everyone in the meeting.

The software swiftly and clearly presents information after analyzing 200 gigabytes of P&G data, which is comparable to 200,000 volumes of the Encyclopedia Britannica. Top executives may use the Business Sphere to find answers to their own unique business problems and to view data in a more natural manner than a straightforward report. The Business Sphere was intended to function as a kind of command center where top managers could convene in person or virtually using Cisco TelePresence to identify the most pressing issues facing the company and who could address them as soon as they arose. P&G now operates more than 50 Business Spheres globally. P&G can now receive the same information regarding point of sale, inventory, advertising expenditures, and shipping data that it did in the past; it simply does it much more quickly and often. The company's upgraded analytics capabilities allow for the presentation of the same data with more clarity and granularity than ever before.

Most P&G managers and executives utilize the organization Sphere, but the corporation was determined to expand the same ideas farther into the organization. The Decision Cockpits can help with that. Over 58,000 P&G workers are now using the technology as the company has begun to provide additional staff access to the same shared data sources These dashboards, or cockpits, provide simple to read graphics that show the state and trends of the company. The cockpits include control charts, real-time statistical analysis, automatic warnings for important occurrences, and the option to "drill down" to more specific layers of data.

Eliminating the time wasted by P&G workers debating the reliability of conflicting versions of data seen in emails, spreadsheets, letters, and reports was one of the main objectives of the Decision Cockpits. All P&G workers can concentrate on making choices that will improve the company by having access to a single source of precise and comprehensive real-time business data. The Business Sphere and Decision Cockpits both exhort P&G management and staff to "manage by exception." This implies that by analyzing the data, managers will be able to reduce the costs associated with producing and shipping goods as well as improve how they plan and arrange sourcing, production, and distribution.

Because they automate the transfer of information across organizational boundaries, supply chain management systems are one sort of interorganizational system. Because these systems allow businesses to electronically connect to consumers and outsource work to other businesses, you may find instances of different interorganizational information systems throughout this book [4]–[6]. Systems for managing customer relationships Systems for managing customer relationships are used by businesses to better manage their relationships with their clients. CRM systems provide data to coordinate all customer-facing company operations in sales, marketing, and service in order to maximize revenue, customer happiness, and customer retention. This data aids businesses in finding, luring, and keeping the most lucrative clients, as well as in improving services for current clients and boosting revenue.

Knowledge Management Methodologies Because they are more knowledgeable about how to develop, manufacture, and distribute goods and services, some businesses operate better than others. This firm's expertise is distinctive, improbable, and may be used to long-term strategic advantage. Organizations may better manage procedures for gathering and using information and expertise with the help of knowledge management systems. In order to enhance corporate

operations and managerial choices, these systems gather all relevant information and expertise inside the company and make it accessible whenever and wherever it is required. They also connect the business with outside knowledge sources.

DISCUSSION

Intranets and Extranets

Enterprise apps provide several chances to consolidate crucial business data into a single system and bring about fundamental changes in the way the company does business. They are often expensive and challenging to deploy. As additional instruments for enhancing integration and accelerating the flow of information inside the company, with customers, and with suppliers, intranets and extranets are deserving of attention.

Simple internal corporate websites that are only available to staff are known as intranets. In contrast to the Internet, which is a public network connecting businesses and other external networks, the phrase "intranet" refers to an internal network. Intranets are often just a private access section inside a larger firm Web site, using the same technology and procedures as the broader Internet. Similarly, extranets. Extranets are corporate websites that are only available to approved vendors and suppliers. They are often used to organize the supply chain for a company's manufacturing facilities.

For instance, Six Flags, which manages 19 theme parks across North America, keeps an intranet for its 2,500 full-time staff members that features news about the business and details on the regular activities of each park, such as weather forecasts, performance schedules, and information about groups and celebrities who frequent the parks. Additionally, the business utilizes an extranet to alert its 30,000 seasonal workers of changes to the schedule and park activities.

E-Commerce, E-Government, and Business

The systems and technologies we just discussed are employing networks and the Internet to change businesses' interactions with their clients, workers, suppliers, and logistic partners into digital ones. We use the phrases "electronic business" and "electronic commerce" often throughout this book since so much business is now facilitated by or built upon digital networks. The term "e-business," sometimes known as "digital business," describes how the Internet and digital technologies are used to carry out the main business procedures of an organization. E-business involves both internal company administration tasks and supplier and other business partner collaboration. E-commerce is another term for electronic commerce. E-commerce refers to the area of e-business that deals with the online purchase and sale of products and services. Additionally, it includes tasks that assist with market transactions, such as marketing, customer service, delivery, and payment.

Similar developments in the public sector have also been brought about by e-business-related technology. Governments at all levels are using Internet technology to provide information and services to their constituents, staff members, and business partners. E-government is the use of the Internet and networking technology to digitally allow interactions between government and public sector organizations and the general public, private sector, and other branches of government. In addition to enhancing the delivery of government services, e-government increases the efficiency of government operations and empowers individuals by facilitating their access to information and enabling them to electronically network with one another. The Internet has developed into a potent instrument for immediately organizing interest groups for

political action and fund-raising. For instance, residents of several states may renew their driver's licenses or apply for unemployment benefits online.

Collaboration And Social Business Systems

You may be wondering how it is feasible to make sense of all these systems and data. How can employees in businesses organize everything, strive for shared objectives, and coordinate plans and actions? Information systems cannot decide, recruit or dismiss employees, sign contracts, reach agreements, or change the price of commodities to reflect market conditions. Businesses need specialized systems to promote collaboration and cooperation in addition to the sorts of systems we just outlined.

How do you collaborate

Collaboration is the process of working together to accomplish certain, stated aims. Collaboration, which focuses on job or goal completion, often occurs inside or between enterprises, as well as in other organizations. You work with a Tokyo-based colleague who is an expert in a field you are unfamiliar with. You work closely with several coworkers to write a corporate blog. If you work for a legal firm, you could work with accountants from an accounting business to help a client with tax issues. Depending on the nature of the activity and the connection between participants, collaboration might be short-lived, lasting just a few minutes, or it can endure longer. One-on-one or many-on-many collaboration are both possible.

Employees may work together in unofficial groups that are not formally a part of the organizational structure of the company, or they may be arranged into formal teams. Teams have a clear purpose that a company representative assigns to them. To successfully complete particular duties and execute the team objective as a whole, team members must work together. Teams are often short-lived, depending on the challenges they confront and the time required to discover a solution and complete the objective. The team mission can be to "win the game" or "increase online sales by 10%." [7]–[10]

For several reasons, collaboration and cooperation are more crucial than ever. The nature of labor is evolving. In industrial manufacturing and pre-computer office labor, when each step of the production process happened independently of one another and was managed by supervisors, the nature of work has altered. Silos were used to coordinate the work. Work was transferred between desks and machine tool stations inside a silo until the final product was produced. Jobs nowadays need considerably tighter collaboration and communication between the parties engaged in providing the service or creating the product. According to a recent study from the consulting company McKinsey & Company, employment where contact is the main value-adding activity currently make up 41% of the U.S. labor force. Nowadays, employees often work in production groups, or pods, even in factories. Professional job is expanding. "Interaction" positions often involve tight coordination and collaboration and are held by professionals in the service industry. Working in a professional setting requires a high level of knowledge as well as the exchange of ideas and information. Each actor working on the project offers specific knowledge to the issue, and all players must take one another into consideration in order to complete the task.

Organizational changes at the company. Managers arranged work in a hierarchical manner during a large portion of the industrial period. Orders were given at the bottom of the hierarchy, while answers were given at the top. Groups and teams are used in the workplace today, and each member is expected to come up with their own strategy for getting the job done. Senior managers monitor and evaluate performance but are far less likely to provide specific instructions or operational guidelines. This is due in part to the fact that knowledge and

authority in decision-making have become decentralized in companies. Adapting the firm's scope. The company's operations have expanded from a single site to many, including offices or factories dispersed throughout a region, a country, or perhaps the whole world. For instance, Henry Ford built the first car plant for mass manufacturing at a single facility in Dearborn, Michigan. Ford employed around 166,000 workers in 2012 at roughly 90 factories and locations across the globe. The need for tight coordination of design, manufacturing, marketing, distribution, and service clearly has significant significance and scale with this level of worldwide presence. Teams that operate globally are necessary for large international corporations.

Inventiveness is the key. Although we often credit outstanding people with their advances in business and science, these great individuals almost certainly collaborate with a group of equally clever coworkers. Consider the highly acclaimed inventors Bill Gates and Steve Jobs, who both created effective collaborative teams to foster and encourage innovation in their companies. The first innovations they made a result of tight cooperation with partners and coworkers. In other words, creativity is a collective and social activity, and the majority of breakthroughs result from human cooperation in a lab, a company, or a government organization. Strong collaborative technologies and practices are thought to accelerate and improve invention. Workplace and corporate cultures are evolving. The majority of studies on cooperation supports the idea that diverse teams create better results more quickly than people working alone. Crowd perceptions also provide cultural support for cooperation and teamwork.

Social Business: What Is It

By adopting social business the use of social networking sites like Facebook, Twitter, and internal corporate social tools many businesses today improve cooperation by including their workers, clients, and suppliers. With the use of these technologies, employees may create profiles, join groups, and "follow" one another's status updates. In order to speed up and improve information exchange, creativity, and decision making, social business aims to strengthen contacts with both internal and external groups. Customers, suppliers, workers, managers, and even oversight organizations often hold dialogues about businesses, sometimes without the awareness of the company or its major players.

Supporters of social business contend that by listening in on these talks, businesses would strengthen their relationships with clients, partners, and staff members, enhancing their emotional investment in the company. The disclosure of a lot of information is necessary for all of this. People must communicate their ideas and knowledge to one another openly, without the interference of managers or other parties. Employees discover firsthand what consumers and coworkers think, suppliers will learn firsthand what partners in the supply chain think, and managers will likely learn more firsthand about their employees' performance. Nearly everyone engaged in the process of creating value will be considerably more aware of one another. If such a setting could be established, it would probably increase operational effectiveness, encourage creativity, and hasten decision-making. Product designers may hasten the redesign process if they have immediate access to information about how their products are doing in the market based on customer input. Employees will be able to perform more effectively and address more business issues if they can leverage their social connections both within and outside of the organization to get fresh information and ideas.

Collaboration with social businesses and its benefits for business although there are numerous papers and books on collaboration, almost all of the study is anecdotal. However, there is a widespread assumption in both the business and academic sectors that collaboration inside and between organizations is more important than in the past and that the more "collaborative" a

commercial company is, the more successful it will be. Investing in collaboration technology led to organizational improvements that returned over four times the amount of the investment, with the greatest benefits for the sales, marketing, and research and development functions, according to a recent global survey of business and information systems managers.

Financial results

Customer complaints and concerns may be resolved more quickly and successfully when people collaborate and use social media platforms than when they do it alone. Because of everything said above, collaborative businesses perform better financially and in terms of sales and sales growth. Another research on the usefulness of cooperation discovered that there was a significant overall economic benefit: for every word an employee read in emails from others, an extra $70 in revenue was produced. According to experts at McKinsey & Company, the usage of social technology inside and between organizations has the potential to increase interaction employees' productivity by 20 to 25%.

Creating collaborative business practices and a culture

In a company setting, collaboration won't happen on its own, particularly if there is no enabling culture or business procedures. Business organizations, particularly big ones, have a history of being thought of as "command and control" structures where the top executives come up with the most significant ideas and then give orders to lower-level staff to carry them out. It was purportedly the responsibility of middle management to communicate with those above and below in the hierarchy.

Lower-level staff in command and control organizations were expected to follow instructions without inquiry, without being held accountable for streamlining procedures, and without receiving any recognition for their efforts as a team. The superiors should be informed if your work group need assistance from another work group. You only ever communicated vertically, never horizontally, so management could direct the workflow. Together, the management and employee expectations created a culture, or a set of presumptions about shared objectives and appropriate behavior. This is how many companies still do business.

Business procedures and a collaborative corporate culture are extremely unlike. Although teams of workers are used to accomplish and execute the outcomes, senior managers are still accountable for results. Teams from all levels of the business are much more necessary to invent, produce, and construct policies, products, designs, procedures, and systems. Both teams and individuals that do well on a team are rewarded for their efforts. Building the teams, coordinating their work, and keeping an eye on their performance are the duties of middle managers.

In a collaborative culture, senior management identifies collaboration and cooperation as essential to the firm and actually executes collaboration for the upper levels of the business as well, making the corporate culture and business processes more "social".

Collaboration Tools and Technologies and Social Business

Without information technologies in place to support collaboration and social business, a collaborative, team-oriented culture won't provide advantages. Numerous techniques are created to cope with the reality that we must rely on one another our coworkers, clients, suppliers, and managers in order to thrive in our employment. Even while certain pricey high-end products, like IBM Lotus Notes, are sophisticated enough for multinational corporations. Others are suitable for small firms and are freely accessible online. Let's examine a few of these tools in greater detail.

Instant Messaging and email

For interaction occupations, e-mail and instant messaging have become important tools for cooperation and communication. Their program has functionality for file sharing and message transmission and runs on PCs, mobile phones, and other wireless portable devices. Users of several instant messaging platforms may have simultaneous, multi-party discussions in real time. Email use has decreased recently, with texting and social media replacing it as the main means of communication.

Wikis

Wikis are a specific kind of website that allow users to easily add and change text material and visuals without needing any programming or web design expertise. Wikipedia, the world's biggest collaboratively maintained reference project, is the most well-known wiki. It is entirely volunteer-run, has no revenue, and doesn't take any advertising.

Wikis are excellent resources for preserving and disseminating business information and ideas. Enterprise software provider SAP AG offers a wiki that serves as a knowledge source for those outside the business, such clients and programmers who create applications that connect with SAP software. Those folks used to ask and sometimes respond to queries informally on SAP online forums, but that approach was ineffective since the same questions were often asked and replied.

Online worlds

Online 3-D environments known as virtual worlds, like Second Life, are inhabited by "residents" who have created graphical representations of themselves known as avatars. Real-world people represented by avatars meet, interact, and exchange ideas at these virtual locations using gestures, chat box conversations, and voice communication. Organizations like IBM and Instead, an international business school with campuses in France and Singapore, are using this virtual world to house online meetings, training sessions, and lounges.

CONCLUSION

In conclusion, Systems for enterprise integration are essential for tying together the many parts and operations of a business. These technologies make effective communication, collaboration, and data sharing possible by seamlessly linking systems, departments, and stakeholders. Integration systems provide businesses the ability to streamline operations, improve decision-making, and adapt to a changing business environment. Enterprise integration systems must be used if firms are to promote innovation, operational efficiency, and long-term expansion. Enterprise integration system implementation and upkeep, however, create difficulties. In addition to ensuring data security and quality, organizations must also handle concerns with interoperability across various systems and technologies. Integration systems' proper operation and dependability depend on system administration, monitoring, and continuing maintenance.

REFERENCES

[1] M. C. Torri, “The jamu system: Linking small-scale enterprises, traditional knowledge and social empowerment?,” *Int. J. Entrep. Small Bus.*, 2012, doi: 10.1504/IJESB.2012.046477.

[2] P. Oghazi, F. Fakhrai Rad, S. Karlsson, and D. Haftor, “RFID and ERP systems in supply chain management,” *European Journal of Management and Business Economics*. 2018. doi: 10.1108/ejmbe-02-2018-0031.

[3] P. N. M. Linh and N. T. T. Huong, "The Supply Chain and Logistics of Vietnam in the Context of International Economic Integration," *Int. Bus. Res.*, 2020, doi: 10.5539/ibr.v13n7p27.

[4] D. Wood, *Linking enterprise data*. 2010. doi: 10.1007/978-1-4419-7665-9.

[5] P. B. Nielsen, "The puzzle of measuring global value chains – The business statistics perspective," *Int. Econ.*, 2018, doi: 10.1016/j.inteco.2017.05.004.

[6] C. Morrison and E. Ramsey, "Power to the people: Developing networks through rural community energy schemes," *J. Rural Stud.*, 2019, doi: 10.1016/j.jrurstud.2018.07.006.

[7] M. C. Torri, "The JAMU System in Indonesia: Linking Small-Scale Enterprises, Traditional Knowledge and Social Empowerment Among Women in Indonesia," *J. Int. Womens. Stud.*, 2012.

[8] W. Phillips, H. Lee, A. Ghobadian, N. O'Regan, and P. James, "Social Innovation and Social Entrepreneurship: A Systematic Review," *Gr. Organ. Manag.*, 2015, doi: 10.1177/1059601114560063.

[9] U. Goswami, "Neurociencia y Educación: ¿podemos ir de la investigación básica a su aplicación? Un posible marco de referencia desde la investigación en dislexia," *Psicol. Educ.*, 2015, doi: 10.1016/j.pse.2015.08.002.

[10] R. Hornyak, A. Rai, and J. Q. Dong, "Incumbent system context and job outcomes of effective enterprise system use," *J. Assoc. Inf. Syst.*, 2020, doi: 10.17705/1jais.00605.

CHAPTER 7

CHECKLIST FOR MANAGERS: EVALUATING AND SELECTING COLLABORATION AND SOCIAL SOFTWARE TOOLS

Dr. Vinay Muddu
Professor, Masters in Business Administration,
Presidency University, Bangalore, India.
Email Id: muddu.vinay@presidencyuniversity.in

ABSTRACT:

Collaboration and social software tools have become essential for modern organizations, enabling improved communication, knowledge sharing, and teamwork. However, with a wide range of options available, selecting the right tools can be a challenging task for managers. This abstract provides an overview of the checklist for managers to evaluate and select collaboration and social software tools effectively. The checklist begins with identifying organizational needs and objectives. Managers should assess the specific collaboration requirements of their teams and consider factors such as communication channels, document sharing, project management, and integration capabilities. Understanding the unique needs of the organization is crucial for selecting tools that align with its goals and support its workflows.

KEYWORDS:

Adoption Rate, Collaboration Features, Compatibility, Cost-Effectiveness, Customization Options, Data Security.

INTRODUCTION

There are currently software product suites that provide multi-functional platforms for social business and cooperation among teams of workers who operate together from various places. Internet-based audio and video conferencing systems, online software services like Google Apps/Google Sites, cyber lockers, business collaboration tools like Lotus Notes and Microsoft SharePoint, and business social networking tools like Salesforce Chatter, Microsoft Yammer, Jive, IBM Connections, and Smart Cloud for Business are the most popular [1], [2].

Systems for virtual meetings

Many businesses, both big and small, are using videoconferencing and web conferencing technology in an attempt to save travel costs. Virtual meeting systems are used by organizations like Heinz, General Electric, PepsiCo, and Wachovia for product briefings, training sessions, strategy meetings, and even motivational conversations. Using two-way video and audio transmissions, a videoconference enables simultaneous communication between people in two or more locations. Telepresence technology, an integrated audio and visual environment that enables a person to create the impression that they are present at a place other than their actual physical location, is a characteristic of high-end videoconferencing systems. Zoom.us, novo, and other free or inexpensive Internet-based solutions like Skype group videoconferencing are of inferior quality but nonetheless helpful for smaller businesses. Tools for one-on-one videoconferencing include Google Video Chat and Apple's FaceTime.

Web-based online meeting technologies like Cisco WebEx, Microsoft Live Meeting, and Adobe Connect are particularly useful for training and sales presentations in businesses of all

kinds. With the aid of these solutions, participants may exchange presentations and papers as well as voice conferencing and live Webcam video.

Cloud Collaboration Services with Google Apps/Google Sites Google Apps/Google Sites is one of the most extensively used "free" online collaboration tools. Users may instantly construct group-edit Web pages online using Google pages. One component of the wider Google Apps toolkit is Google Sites. Users of Google Sites may create and fill websites in a matter of minutes and upload a range of assets, such as calendars, text, spreadsheets, and videos, for private, group, or public reading and editing, all without needing any basic technical knowledge.

The common desktop productivity office software tools are included in Google Apps, which integrate with Google Sites. Businesses may purchase the Premier version for $50 per user per year, which includes 25 gigabytes of mail storage, a 99.9% email uptime guarantee, tools to interface with the company's current infrastructure, and round-the-clock phone assistance. 2 An example of a cloud-based cyber locker is Google Drive. Cyber lockers are online file-sharing tools that let users submit data to safe cloud storage facilities, where they may then be distributed to others. Google Drive provides 5 gigabytes of online storage at no cost; extra monthly fees apply for storage over that amount, up to 16 terabytes. This service is compatible with many browsers, mobile devices, and operating systems. Some sorts of documents may be created and edited online by users, who can sync these files across all of their devices and share them with others. Because Google Docs is integrated with Google Drive, users may edit documents, spreadsheets, and presentations in real-time and get alerts when someone comments.

Dropbox and Microsoft SkyDrive are two other cyber locker services used for collaboration. Depending on the quantity of storage space needed, both provide free and premium services. With options to make the files private or public and share them with certain contacts, users may synchronize their online files with their local PCs and many other types of devices. Office Web Apps are Microsoft's online versions of Word, Excel, PowerPoint, and OneNote. Microsoft SkyDrive provides 7 gigabytes of free online storage for Office documents and other data. The document creation and editing features are not available inside Dropbox itself. SharePoint by Microsoft SharePoint is a sophisticated search engine and browser-based platform for document management and collaboration that is deployed on corporate servers. Microsoft Office desktop software products are closely integrated with SharePoint, which provides a Web-based interface. Employees may share their papers and work together on projects using Office documents as the basis thanks to the SharePoint software.

To help teams coordinate work activities, collaborate on and publish documents, manage task lists, create workflows, and share information through wikis and blogs, SharePoint may be used to host internal Web sites that organize and store information in a single central workspace. Users may manage document security settings and versions.

Users that collaborate closely on tasks, projects, and documents may access pertinent information quickly and effectively with SharePoint since it centrally stores and organizes information. Finding people, knowledge, and material is made easier by enterprise search technologies. As mentioned in the opening instance, social features have just been introduced to SharePoint [3], [4].

ICA is a large Mexican construction firm with operations in North, South, and Central America as well as Europe that specializes in infrastructure projects. Microsoft SharePoint Server 2010 was used by the business to arrange the 500,000 documents that its 3,000 workers utilize every day. Now, ICA staff members can quickly find the files and internal knowledge they need to

complete projects on schedule and under budget. The security of project documentation has been improved, and ICA has established online forums where it may access the expertise of internal specialists.

Lotus Notes A collaborative software system featuring features for calendar sharing, group writing and editing, shared database access, and electronic meetings, with each participant able to view and display information from others and other activities, Lotus Notes was an early example of groupware. Applications are obtained from an IBM Lotus Domino server using Notes software installed on desktop or laptop devices. Now that Lotus Notes is Web-enabled, users may create bespoke applications to meet their particular requirements using a scripting environment and an application development environment.

The user's client computer may be used as a platform for email, instant messaging, Web surfing, calendar/resource reservation work, as well as for engaging with collaborative applications, thanks to Notes software installed on it. Today, Notes also includes features for phone and video conferencing, online meetings, wikis, RSS aggregators, help desk systems, blogs, microblogs, and blogs. Because IBM Lotus Notes provides high levels of security and dependability as well as the capacity to maintain control over critical company information, large businesses choose to utilize it. For instance, the Magnum AS Group utilizes Lotus Notes to handle more than 500,000 documents and adhere to stringent regulatory standards.

The Magnum AS Group specializes in wholesale and retail sales of medicines and medical supplies across the Baltic States. The program offers a single store for all corporate documentation, including textual papers, spreadsheets, photos, PDF files, and emails, with complete version control. Users may do a single search to discover the most recent version of a document. Only authorized individuals are able to alter documents, which improves security and makes it easier to comply with the strict rules and audit requirements of the global pharmaceuticals sector.

Two associated IBM Lotus products provide more specific social networking and collaborative technologies and can access data from Lotus Notes. IBM Using team spaces, content libraries, discussion forums, and wikis, Lotus Quick facilitates document and information sharing among groups of people. IBM Connections offers features for searchable profiles, communities, blogs, activities, wikis, and forums to promote internal corporate social networking. In order to promote creativity and teamwork among its 3,100 workers globally, Roland Corporation, a Japanese maker of electronic musical instruments, musical amplifiers, professional video and audio, and computer music equipment, employs Lotus Quick and IBM Connections.

It now has a "electronic public square" where notions and ideas may be shared as they emerge. Lotus Quick assists the business in managing and following up on initiatives, such as a new product launch where 200 workers, 90% of whom were located abroad, were engaged. The program collected and saved all the data related to the product launch and made it considerably simpler to create Web sites for the related sales activities. Connections allowed employees communicate knowledge and ideas informally and helped specialists and experts inside the firm become more visible.

DISCUSSION

Enterprise Social Networking

However, there are other, more specialized social platforms for this purpose, such as Salesforce Chatter, Microsoft's Yammer, Jive, and IBM Connections. platforms the technologies we just discussed contain features for enabling social business. By linking people of an organization

via profiles, updates, and notifications features like to those on Facebook but designed for use inside a corporation enterprise social networking platforms provide value to the company. Recently, IBM unveiled Smart Cloud for Social Business, a collection of social business tools that operate on a cloud platform and include user pro- files, communities, email, instant messaging, Web meetings, calendars, personalized dashboards, and file sharing [5], [6].

About 2,000 workers at the Dallas-based 7-Eleven Inc. have been using Yammer since May 2011. The convenience store network made use of the software to allow field consultants, who work with regional franchise owners, to exchange expertise and learn from one another about best practices. An image of a display that performed very well at one franchise location, for instance, may be posted online for others to see and use in their locations. The social software creates a "virtual water cooler" setting where individuals may discuss events informally while maintaining formal documentation to monitor best practices. Although 7-Eleven and other businesses have profited from corporate social networking, consumer adoption of Facebook, Twitter, and other public social networking services has been faster.

How do you choose the right collaboration technology for your company when there are so many social business tools and services available? To answer this question, you need a framework for understanding just what problems these tools are designed to solve. One framework that has been useful for us to talk about collaboration tools is the time/space collaboration matrix developed in the early 1990s by a number of collaborative work scholars. The time/space matrix focuses on the two dimensions of the collaboration problem: time and space. For example, if you need to collaborate with people in different time zones, you cannot all meet at the same time and it is challenging to hold a videoconference because midnight in New York is noon in Bombay.

Depending on whether they facilitate interactions that take place at the same time and place or at a separate location, and whether they are remote or collocated, collaboration and social technologies may be categorized. Assembling individuals for a physical meeting is challenging due to the geographical dispersion of dispersed enterprises, the expense of travel, and the time constraints of management. Place also hinders cooperation in huge global or even national and regional organizations. Using this time/space frame- work will help you choose the most appropriate collaboration and teamwork tools for your firm. Note that some tools are applicable in more than one time/place scenario. For example, Internet collaboration suites such as Lotus Notes have capabilities for both synchronous and asynchronous interactions. Here is a "to-do" list that you can use as a starting point: If you follow these six stages, you should be guided toward purchasing the appropriate collaboration software for your company at a cost that you can afford and that falls within your risk tolerance. Locate your company in the time/space matrix. Your business may occupy more than one cell in the matrix. Different collaboration tools will be required for each case.

1. What are the collaboration issues confronting the firm in terms of time and space?
2. List the particular types of solutions that are offered for each cell in the matrix where your company confronts issues.
3. Consider the expenses of training in your cost estimates, as well as the costs of incorporating the information systems department, if necessary, and analyze each product in terms of its value to your company.
4. Describe the security and vulnerability risks associated with each of the products. Is your company willing to trust external service providers with its confidential data over the Internet? Is your company willing to entrust critical operations to systems run by other

companies? What are the financial risks your vendors face? Will they be around in three to five years? What would it cost to switch to a different vendor in the event the vendor went out of business?

5. Since some of these technologies are more user-friendly than others, enlist the aid of prospective users to help you discover implementation and training problems.

6. Choose the potential tools, then ask the suppliers to exhibit their products.

The Functions of The Information Systems

Business

Business end users manage their systems from a business standpoint, but managing the technology requires a special information systems function. We've seen that businesses need information systems to operate today and that they use a variety of systems. But who is responsible for running these systems? Who is responsible for making sure the hardware, software, and other technologies used by these systems are running properly and are up to date? The formal organizational unit in charge of information technology services in all but the smallest companies is the information systems department, which is also in charge of maintaining the hardware, software, networks, and data storage that make up the company's IT infrastructure.

The Department Of Information Systems

Project managers, information systems managers, programmers, systems analysts, and other highly trained technical specialists make up the information systems department. Systems analysts serve as the main point of contact between the information systems groups and the rest of the organization, and it is their responsibility to translate business problems and requirements into information.

The chief information officer (CIO) is a senior manager who oversees the use of information technology in the company. The chief security officer (CSO) is in charge of the company's information systems security and is in charge of enforcing the company's information security policy. The CSO is also in charge of informing management of security threats and breakdowns and maintaining the tools and policies chosen to implement security.

Companies collecting large amounts of personal data have created positions for a chief privacy officer (CPO), who is in charge of making sure the business complies with applicable data privacy laws. Information systems security and the need to safeguard personal data have become so important that corporations have established positions for a CPO. The chief knowledge officer (CKO), who assists in the creation of programs and systems to identify new sources of information or to improve the use of existing knowledge in organizational and management processes, is in charge of the company's knowledge management program. End users, or users who represent departments other than the information systems group for whom applications are produced, are becoming more and more involved in the planning and creation of information systems.

Today, a growing percentage of staff members are systems analysts and network specialists, with the information systems department acting as a powerful change agent in the organization. The information systems department suggests new business strategies and new information-based products and services, and coordinates the development of these new products and services. While all IS occupations show above-average growth, the fastest growing occupations are computer support specialists, systems analysts, software engineers and programmers, and

information systems managers. In the next five years, employment growth in IS/MIS jobs will be about 50 percent greater than the average job growth in other fields. MIS is ranked 15th in terms of salaries.

Setting Up The Information Systems To Work

A very small business will not have a formal information systems group; instead, it may have one employee who is in charge of maintaining its networks and applications, or it may hire consultants to handle these tasks. Larger businesses will have a separate information systems department, which may be organized in a variety of ways depending on the company's needs.

IT governance, which specifies the decision rights and framework for accountability to ensure that the use of information technology supports the organization's strategies and objectives, includes the strategy and policies for using information technology within an organization. How much should the information systems function be centralized? What decision rights should the information systems department have?

Practical MIS Projects

You get practical experience utilizing a spreadsheet to make better supplier decisions, Internet software to plan effective transportation routes, and analysis of chances to enhance company operations with new information system applications via the projects in this area.

Problems with management decisions

1. Prices of lumber and other building materials are constantly changing, so sales representatives consult a manual price sheet and then call the supplier for the most recent price. The supplier uses a manual price sheet, which has been updated each day. Don's Lumber Company on the Hudson River offers a large selection of materials for flooring, decks, moldings, windows, siding, and roofing.

2. Henry's Hardware is a small family business in Sacramento, California. Henry and Kathleen must utilize every square foot of the store space as profitably as possible. They have never kept detailed inventory or sales records. As soon as a shipment of goods arrives, the items are immediately placed on store shelves. Invoices from suppliers are only kept for tax purposes. When an item is sold, the item number and price are rung up at the cash register. By filtering transactional data on suppliers based on a variety of criteria to choose the finest suppliers for your business, you will learn how to utilize spreadsheet software to enhance management choices about picking suppliers in this exercise.

You are the owner of a company that produces aircraft components, and you are trying to figure out if you can benefit from better supply chain management. In MyMISLab, you will find a spreadsheet file that lists every item that your company has purchased from its suppliers over the last three months. The fields in the spreadsheet file include vendor name, vendor ide, and vendor price. Prepare a recommendation for how you can use the information in this spreadsheet database to improve your decisions about choosing suppliers. Some factors to take into account for identifying preferred suppliers include the supplier's history of on-time deliveries, suppliers offering the best accounts payable terms, and suppliers offering lower pricing when the same item can be provided by multiple suppliers.

Teamwork and Collaboration Project

You may finish a collaborative and Teamwork Project in MyMISLab that deals with the ideas in this by using Google Sites, Google Docs, and other free and open-source collaborative technologies. TUC Income, one of Singapore's largest insurers, employs about 3,400 insurance

advisors and 1,200 office staff, with the majority of them spread out across an eight-branch network. On June 1, 2003, Income succeeded in the migration of its legacy insurance systems to a digital web-based system. The Herculean task necessitated not only the upgrading of hardware and applications, but also Inco. Before a few years ago, Income's insurance procedures required a lot of time-consuming paper work and began with consumers meeting with an agent. Forms were filled out by an agent, who then submitted them to branches where they were sent by couriers to the Office Services department. The collection schedule could cause delays of two to three days. Office Services would log documents, sort them, and then send them to departments for underwriting. Proposals were assigned to underwriting staff, mostly at random. Accepted proposals were sent for printing at the Computer Servic

The HP 3000 mainframe that housed the basic insurance applications as well as the accounting and management information systems fell down repeatedly in 2002 despite recurrent expenditures to modernize it, forcing work to halt while data was recovered. The HP 3000 system experienced a total of three major hardware failures, resulting in a total of six days of complete downtime. Additionally, the HP 3000 backup system could only restore the data to the version from the previous day, meaning that backups had to be performed at the end of every day in a costly and laborious process, or the company would risk losing important data. The IT team found building new products in COBOL to be rather onerous and the time needed to launch new goods varied from a few weeks to months. Additionally, the IT team discovered that developing new products in COBOL stopped the systems and created periodic interruptions. While processing a new customer application for motor insurance, staff did not know if the applicant was an existing Income customer because transaction processing for policy underwriting was still a batch process and information was not accessible to agents and advisors in real-time. As a result, opportunities for cross-product sales were lost because staff had to pass physical documents back and forth and had no way to view a customer's policy history.

All of this changed in June 2003 when Income switched to the Java-based eBay Life System from eBao Technology. The program, which included three sub-systems called Policy Administration, Sales Management, and Supplementary Resources, met many of the company's requirements, including customer-oriented design, barcode technology capabilities, and the capacity to support changes in business processes. By May 2003, all customization, data transfer of Income's individual and group life insurance businesses, and training had been completed. Implementation work had begun in September 2002 and was finished in nine months. All applications were housed on two or more servers, each connected by two or more communication lines, and all of which were "load balanced"; this robust architecture reduced the likelihood of downtime occurring due to hardware or operating system failures.

Income decided to replace its entire IT infrastructure as part of the eBay implementation, including all service branches with scanners, changing monitors to 20 inches, increasing PC RAM to 128 MB, and installing new hardware and software for application servers, database servers, web servers, and disk storage systems.

In addition, faster connections, a fiber-optic backbone, and wireless capabilities were used in lieu of the LAN cables. Income also updated its business continuity and disaster recovery plans, implementing a real-time hot backup disaster-recovery center where the machines were always running and fully functional and transferring data instantly and on-the-fly from the primary datacenter to the backup machines' data storage. In the event that the datacenter site became unavailable, operations could be switched quickly to the disaster-recovery site without the need to stop. The transition to a paperless environment, however, was not simple. Income had to destroy all paper records, including legal paper documents. Under the new system, all

documents were scanned and stored on "trusted" storage devices - secured, dependable digital vaults that enabled strict compliance with stringent statutory requirements [7], [8].

CONCLUSION

In order to evaluate the usability and compatibility of the selected technologies with the organization's processes, managers should think about organizing trials or demonstrations of the solutions. Pilot testing and user feedback provide important insights into the tool's efficacy, usability, and user happiness. Cost factors are also quite important. Managers should assess the costing structures of the collaborative and social software solutions, taking into account any up-front expenses, license prices, subscription fees, and extra expenditures for supplemental features or user upgrades. The price of the tool must be in line with the organization's budget and anticipated return on investment. Managers may use this checklist to methodically assess and choose the collaborative and social software products that are most appropriate for their firm. A well selected technology stimulates information sharing, increases team productivity, and fosters cooperation, all of which contribute to an organization's success in the digital age.

REFERENCES

[1] P. J. van der Wees *et al.*, "Development of a framework with tools to support the selection and implementation of patient-reported outcome measures," *J. Patient-Reported Outcomes*, 2019, doi: 10.1186/s41687-019-0171-9.

[2] J. B. Burnham, "Evaluating industry/university research linkages," *Research Technology Management*. 1997. doi: 10.1080/08956308.1997.11671105.

[3] J. Ward and J. Peppard, *Strategic Planning for Information Systems 3rd Edition*. 2002.

[4] D. Atchison, "Greening stormwater infrastructure: Integrating low-impact development with traditional methods in Washington State," 2009. doi: 10.1061/41009(333)114.

[5] H. Clement and D. Salois-Swallow, *Strategic Planning for an Information System (John Ward and Joe Peppard)*. 2002.

[6] H. Mohammedi and H. Teymouri, "The assessment of health, safety and environment management system in Zanjan zinc industrial plants from the resilience engineering perspective in 2018," *Iran Occup. Heal.*, 2020.

[7] R. A. Philips, *Guide To Software Export: A Handbook For International Software Sales*. 2014. doi: 10.4324/9780203824795.

[8] P. S. Yoder-Wise, *Leading and Managing in Nursing - Revised Reprint*. 2013.

CHAPTER 8

EXPLORING THE INFORMATION SYSTEMS AND ITS ORGANIZATIONS

Mr. Mrinmoy Biswas
Assistant Professor, Masters in Business Administration,
Presidency University, Bangalore, India.
Email Id: biswas@presidencyuniversity.in

ABSTRACT:

Information systems play a pivotal role in modern organizations, serving as a critical component for effective management and strategic decision-making. This abstract provides an overview of the interrelationships between information systems, organizations, and strategy, highlighting their significance, characteristics, and the benefits they offer to organizations. Information systems encompass the hardware, software, data, processes, and people that collect, process, store, and distribute information within an organization. They support various functions, such as data management, communication, collaboration, and decision support. Information systems enable organizations to efficiently manage their operations, gain insights from data, and respond to market dynamics.

KEYWORDS:

Alignment, Business Processes, Data Analytics, Digital Transformation, Enterprise Architecture, Information Technology (IT) Governance.

INTRODUCTION

Sears has made significant investments in information technology over the years. It once invested more in networking and information technology than any other American company that wasn't a computer, with the exception of the Boeing Corporation. In order to target certain demographics with unique incentives, Sears leveraged its enormous customer database of 60 million past and current Sears's credit card members. Due to one of the highest cost structures in its sector, Sears' efforts did not result in a competitive edge. The business has been reluctant to refurbish its 2,172 shops, many of which are dilapidated and in unappealing areas, keep up with modern retail trends, and save operational expenses. It continues to struggle to come up with a workable business plan that would help it get out of its rut.

With the use of new technological tactics including online shopping, mobile applications, and an Amazon.com-type marketplace with other suppliers for 18 million goods, together with aggressive in-store promotions, the Sears firm attempted to boost declining sales. Sales have decreased since the 2005 merger, and so far these efforts have not been successful. In 2011, the business reported a $3.1 billion loss. Lou D'Amboise, CEO of Sears Holdings, believes he has a solution: even greater use of technology and data mining from customers. It is anticipated that greater understanding of consumer preferences and purchasing trends would increase the effectiveness of promotions, merchandising, and selling. Due of their extensive inventory, Sears shops will see a surge in customers [1]–[3].

Shop Your Way Rewards, a customer loyalty program, offers clients attractive freebies for subsequent purchases in exchange for their consent to share their individual buying information with the business. Although loyalty-marketing company Colloquy believes that almost 50 million individuals are members, Sears declined to provide information on the number of

consumers who had signed up for Shop Your Way Rewards. Customers who use these cellphones to "check in" at select Sears's shops will be met by Sears staff who will then take them to the flat-panel TVs and French Connection ankle jeans they previously looked for online using the global positioning systems on their mobile devices. According to Michael Archer of Kurt Salmon management consultants, who worked on the creation of Citibank's American Airlines loyalty cards, "it's the equivalent of walking into a coffee shop and not having to say anything as someone prepares your coffee with just the right amount of cream and sugar."

The information Sears is gathering is influencing how its sales floors are set up and how promotions are created to attract customers. For instance, the location of workwear has been shifted closer to the tool store. Following data research that revealed many tool-buying males were jewelry buyers, the business developed a unique Valentine's Day promotion for Shop Your Way Rewards members that provided $100 in credit for every $400 spent on jewelry. D'Amboise claims that the amount of money consumers are spending with their loyalty points "has exceeded our expectations."

In 2011, Sears invested several hundred million dollars in renovating its locations, including new technology. One of the hundred Sears stores that underwent recent remodeling is the one in Woodfield Mall. The section next to the main mall entrance is dominated by outdoor clothes from Lands' End, while the main hall is lined with women's shirts from Covington in soft pastel colors. Employees browse internet reviews for consumers and monitor stock levels using iPads and iPod Touches. Ron Bore, who is in charge of Sears' merchandising and store layouts, is certain that he can improve the in-store experience significantly with a little more time and consumer data. Experts in the retail sector, though, are dubious. The Target, Macy's, and other retail companies already offer programs very similar to the Sears Shop Your Way Rewards program, and these programs by themselves cannot turn a business around. A strong loyalty program may be a strategic asset, according to Jim Sullivan, a partner at the loyalty marketing company Colloquy, provided it helps a business learn more about what its consumers really want. On the other hand, "even the best loyalty programs can't fix a fundamentally broken brand."

The tale of Sears highlights some of the ways in which information systems assist companies in competing and sheds light on the difficulties in maintaining a competitive edge. With so many big, strong firms and competition from both the Internet and traditional physical establishments, the retail industry is highly saturated today. The firm is suffering with all of these competitive challenges and is looking for a competitive strategy to restore its footing. At one point, Sears was the leading retailer in the United States.

The introductory graphic highlights crucial issues brought up by this case and this. By many accounts, Sears is a dwindling company burdened with an excessive number of underperforming physical facilities in unappealing neighborhoods. It has experimented with a wide range of competitive tactics throughout the years, including mergers, advertising campaigns, shop renovations, and numerous technological efforts. All have failed to stop the flow of crimson ink. The most recent attempt from Sears combines technology and loyalty-rewards programs in the hopes that more aggressive data mining on consumer preferences would allow shops to provide customers with the products they desire and give greater shopping experiences. The case study clearly demonstrates how challenging it will be to do this. Given its history of mistakes and its damaged brand reputation, Sears may not be able to maintain a competitive edge or restore competitive momentum. Sears' issues won't be resolved by technology on its own unless it restores its damaged brand image and develops a more stable economic strategy. Here are some issues to consider: 1. how do the value chain models and

competitive factors relate to Sears? 2. Go to a Sears shop nearby and look at the sales activity. Do you believe Sears' new approach has been used there?

DISCUSSION

Organizations and Information Systems

Organizations and information systems interact with one another. Managers design information systems with the goals of the business company in mind. To take advantage of emerging technology, the organization must simultaneously be aware of and receptive to the impacts of information systems. Organizational structure, business processes, politics, culture, external environment, and management actions all play a role in the complex interplay between information technology and companies. Understanding how information technology might alter social and professional life in your company is important. Without knowing your own company structure, you cannot properly develop new systems or comprehend those that already exist.

Many elements, not least of which are the choices made—or not made—by managers, moderate this complicated two-way dynamic. The corporate culture, structure, politics, business procedures, and environment are further mediators of the interaction. According to the microeconomic definition of an organization, labor and capital are turned into goods and services by the company throughout the production process. The environment consumes the goods and services, and as a result, the feedback loop receives more labor and capital as inputs.

You will make the decisions on which systems will be developed, what they will do, and how they will be executed as a manager. You may not be able to foresee all of the effects of these choices. There are certain unforeseen changes that happen in corporate organizations as a consequence of new information technology investments, and the outcomes may or may not live up to your expectations. For example, who could have predicted that e-mail and instant messaging would overtake other forms of corporate communication and that many managers would be deluged with more than 200 emails per day fifteen years ago?

What do organizations do

A formal social structure known as an organization uses resources from the environment and processes them to create outputs. Three components of an organization are the subject of this technical definition.

The main production inputs offered by the environment are capital and labor. In a production function, the company converts these inputs into goods and services. Environments consume the goods and services in exchange for input supply. In terms of durability and regularity, an organization is superior than a loosely organized group.

Organizations must adhere to laws since they are formal, legal organizations with internal policies and procedures. Like a machine has a structure—a specific configuration of valves, cams, shafts, and other parts—organizations are social structures because they are a collection of social components [4]–[6].

Although this definition of organizations is concise and effective, it does not adequately describe or even forecast the nature of organizations in the actual world. A collection of rights, privileges, obligations, and duties that have been carefully balanced through time via conflict and conflict resolution constitutes a more realistic behavioral description of an organization. According to this behavioral theory of the firm, people who work in organizations form accustomed ways of doing things, become attached to pre-existing bonds, and come to

agreements with superiors and subordinates about how much work will be done, how it will be done, and how it will be done. The majority of these agreements and sentiments are not covered in any official rules.

What connections can be seen between these concepts of organizations and information technology? When a corporation adopts new technology, a technical perspective of organizations urges us to concentrate on how inputs are integrated to produce outputs. The company is seen as being eternally changeable, with labor and capital simply substitutable. The more realistic behavioral definition of an organization, however, suggests that creating new information systems or rebuilding old ones entails much more than the technical rearranging of workers or machines; rather, some information systems alter the organizational balance of rights, privileges, obligations, and feelings that have been developed over a considerable amount of time. A significant amount of effort, disruption, and additional resources are needed to assist training and learning when changing these components. For instance, there is a delay between deploying a technical system and training staff members and management on how to use it, thus it takes significantly longer to implement a new information system effectively than is often expected.

Changes in ownership and management of information, access to and updating of that information, and decision-making regarding who, when, and how are all necessitated by technological advancement. This more sophisticated viewpoint compels us to consider how labor is organized and the processes followed to produce results. Organizations may be defined both technically and behaviorally, without contradiction. The technical definition describes how thousands of firms in competitive markets combine capital, labor, and information technology, whereas the behavioral model takes us inside the specific firm to see how that technology affects the organization's inner workings. In fact, they are complementary to one another.

What Organizations Do

Modern businesses all have some traits in common. They are bureaucracies with distinct areas of specialty and division of work. Specialists are arranged in organizations according to a hierarchy of authority where everyone answers to someone and where power is only granted for specified acts that are regulated by arbitrary rules or processes. These regulations provide a framework of fair and inclusive decision-making. Employers attempt to choose and advance workers based on their technical expertise and professionalism. The company is committed to the efficiency principle, which calls for maximum output with minimal inputs. The business procedures, organizational culture, organizational politics, external surroundings, organizational structure, objectives, constituencies, and leadership styles are other organizational characteristics. The kind of information systems that firms utilize are impacted by all of these characteristics.

Business Procedures and Processes

All organizations, including businesses, eventually become very efficient because employees establish routines for generating products and services. Routines, also known as standard operating procedures, are detailed rules, practices, and procedures that have been created to address almost all anticipated circumstances. As workers become extremely productive and efficient as they master these routines, the company is eventually able to minimize expenses as efficiency rises. For example, when you go to the doctor, the receptionists have a well-developed set of routines for getting the essential details from you; the nurses have a different set of routines for getting you ready for an interview with a doctor; and the doctor has a well-

developed set of routines for diagnosing you. These routines are groups of what we called business processes. A set of business procedures makes up a company firm.

Politics in organizations

People work in organizations in a variety of roles with a range of specializations, issues, and viewpoints. They thus naturally have different opinions about the allocation of resources, incentives, and penalties. These distinctions matter to both managers and workers, which leads to rivalry for resources, political power struggles, and conflict inside any firm. One of the biggest obstacles to organizational change, particularly the creation of new information systems, is political opposition. Almost all substantial expenditures in information systems made by a company that result in major adjustments to strategy, corporate goals, business processes, and procedures are political events. Managers that are adept at navigating organizational politics will adopt new information systems more successfully than managers with less experience. This book is filled with several instances when internal politics thwarted information systems' best-laid goals.

Corporate Culture

Every organization has fundamental, indisputable, unquestionable presumptions that guide the development of its objectives and output. This collection of presumptions about what goods the organization should generate, how to produce them, where to produce them, and for whom are collectively referred to as organizational culture. These cultural presumptions are often taken for granted. All companies are made up of unique routines and behaviors, which when combined form a business process. The company firm is made up of a number of business processes. To reach high levels of organizational performance, new information system applications necessitate that individual routines and business processes alter Observing organizational culture in action at your university or institution is easy to do. The fundamental beliefs of university life include the notions that professors are more knowledgeable than students, that students enroll in college in order to learn, and that courses run on a set timetable. Political tension may be subdued by organizational culture, which also fosters shared understanding, agreement on protocols, and common practices. Agreement on other issues is more possible if our fundamental cultural presumptions are the same.

Organizational culture, in particular technical change, is a potent inhibitor to change. Most businesses will do practically everything to avoid altering their underlying presumptions. Any technical advancement that challenges widely held cultural presumptions often encounters strong opposition. However, there are occasions when using a new technology that directly contradicts an established organizational culture is the only rational option for a company to advance. When this happens, technology often stalls while the culture gradually changes.

Corporate Environments

Organizations exist in situations where they draw resources and provide products and services to other people. Environments and organizations are mutually beneficial. On the one hand, organizations are susceptible to and reliant upon their immediate social and natural environments. Organizations cannot function without sufficient funds and human resources—individuals prepared to labor regularly and dependably for a fixed compensation or money from clients. Governmental legislation and other requirements, as well as consumer and petitioner activities, must all be addressed by organizations. Organizations, on the other hand, have some control over their surroundings. For instance, corporations collaborate with other corporations to influence politics, and they use advertising to persuade consumers to buy their goods [7]–[10].

In general, environments change more quickly than companies. Any organization's culture, politics, and workforce are placed to stress by new technologies, new goods, and shifting public preferences and values. The majority of businesses struggle to change with the environment. Organizations are prevented from implementing significant changes by the inertia built into their standard operating procedures, the political friction brought on by changes to the status quo, and the danger to deeply held cultural norms. Young businesses sometimes lack the means to survive even brief periods of difficult circumstances. Not surprisingly, just 10% of the Fortune 500 firms from 1919 are still in operation today. Surroundings impact what companies can accomplish, yet organizations have the power to alter their surroundings entirely. Information technology is essential for helping firms recognize environmental change and take action to influence it.

The Wave of Disruptive Technologies. There are occasions when a technology and the ensuing business innovation completely alter the company environment and landscape. These developments are obliquely referred to as "disruptive." Why are certain technologies disruptive? Disruptive technologies may sometimes be alternative items that function just as well as or even better than anything being produced. The word processor replaced typewriters, the Apple iPod replaced CD players, and process film photography was replaced by digital photography. The vehicle replaced the horse-drawn carriage. In these situations, whole industries were rendered obsolete. In other instances, disruptive innovations only broaden the market, often at considerably lower cost and with far less functionality than current offerings. They eventually develop into low-cost rivals for whatever was previously offered. Disk drives are an example: By providing affordable digital storage for tiny data, compact hard disk drives used in PCs expanded the market for disk drives. In the end, the market for disk drives was dominated by compact PC hard disk drives.

Organizational Design

The sort of organizational structure frequently reflects the type of information systems you will find in a commercial enterprise, as well as the nature of difficulties with these systems. For instance, it is not uncommon to see parallel patient record systems controlled by the administration, another by physicians, and another by other professional staff members such as nurses and social workers in a professional bureaucracy like a hospital. Small entrepreneurial businesses often have hurriedly constructed systems that rapidly outgrow their use. There is often no one integrating information system present in large multi-divisional companies that operate in hundreds of locations; rather, each site or division has its own set of information systems.

Additional Organizational Elements

Organizations have objectives and use a variety of strategies to fulfill them. Others have utilitarian purposes, while other groups have coercive goals. Others still have normative objectives. Organizations also cater to many constituencies or groups; some are mainly for the advantage of its members, while others are for the benefit of customers, investors, or the general public. Different organizations have quite different leadership styles; some may be more democratic or dictatorial than others. The tasks that organizations carry out and the technology they use are two other ways that they vary. Some businesses focus solely on

How Information Systems Affect Business Firms And Organizations

Large enterprises now use information systems as crucial, online, interactive tools that are deeply ingrained in daily operations and decision-making. Information technologies have significantly expanded the options for arranging labor during the last ten years and radically

changed the economics of companies. We can better grasp the changes brought on by IT if we use theories and ideas from economics and sociology.

Financial Impacts

IT affects both the relative costs of capital and information from an economics perspective. A component of production that may be used in place of conventional capital and labor is information systems technology. Information technology is replacing labor, traditionally an increasing expense, as its cost declines. Therefore, when information technology replaces their labor, there should be a decrease in the number of middle managers and clerical workers. Information technology replaces traditional types of capital like structures and machines, which continue to be relatively costly, as their costs fall. Due to its dropping cost in comparison to other capital expenditures, we should anticipate managers increasing their IT investments over time.

IT also alters the economics of information, as well as its cost and quality. Information technology may lower transaction costs the expenses spent when a corporation purchases something from the market that it cannot produce itself helping businesses minimize their size. The transaction cost hypothesis asserts that businesses and people want to reduce transaction costs in a manner similar to how they reduce production costs.

The cost of finding and contacting far-off suppliers, keeping track of contract compliance, purchasing insurance, learning about items, and other expenses make using marketplaces costly. Vertical integration has historically been a strategy adopted by businesses to lower transaction costs.

To achieve this, businesses grow larger, hire more staff, and acquire their own suppliers and distributors, like General Motors and Ford did in the past. It may be more cost-effective for businesses to contract with external providers rather than employing internal resources thanks to information technology, particularly the utilization of networks. As a consequence, businesses might become smaller since it is far less costly to outsource work to a market that is competitive than it is to acquire staff.

For instance, the Chrysler Corporation may save money by sourcing more than 70% of its components from outside sources thanks to computer connectivity to external vendors. Companies like Cisco Systems and Dell Inc. may outsource their manufacturing to contract manufacturers like Flextronics rather than producing everything themselves thanks to information systems.

Because it becomes simpler and more affordable for the company to enter into contracts for the acquisition of products and services in the marketplace rather than producing the item or providing the service directly, firm size should decline as transaction costs fall. Even if a corporation grows its sales, its size might remain constant or even decrease. For instance, the Eastman Chemical Company had 24,000 full-time workers and $3.3 billion in annual sales when it separated from Kodak in 1994. With under 10,000 people, it made almost $7.2 billion in sales in 2011.

Additionally, information technology helps lower the cost of internal management. The company is seen as a "nexus of contracts" among self-interested persons in agency theory as opposed to a single, profit-maximizing organization. A principal uses "agents" to carry out tasks on their behalf. Agents must, however, be constantly managed and watched over in order to prevent them from prioritizing their own interests above those of the owners. Because owners must put in more and more work managing and overseeing personnel as businesses

expand in size and scope, agency expenses or coordination costs increase. Because it is simpler for managers to monitor a larger number of personnel, information technology enables firms to save agency expenses by lowering the costs of information acquisition and analysis. Information technology allows businesses to grow profits while decreasing the number of middle managers and clerical staff by lowering overall management expenses. We've seen instances in the past when information technology increased the authority and reach of small businesses by allowing them to handle tasks like order processing or inventory management with a minimal staff of clerks and managers. We should anticipate a gradual decrease in the size of organizations as more money is spent in IT since IT lowers agency and transaction costs for businesses. Companies should hire fewer managers, and we anticipate that over time, revenue per employee will rise.

CONCLUSION

In conclusion, Information systems act as a vital connection between businesses and their overarching goals. Organizations may improve decision-making, increase operational efficiency, and gain a competitive edge by successfully integrating information systems. In today's dynamic business climate, businesses may better adapt to changing surroundings, seize opportunities, and achieve sustainable success by embracing the synergy between information systems, organizations, and strategy.

However, proper design, execution, and continuous management of information systems are necessary to realize the potential advantages. Organizations must assure data security and quality, integrate information systems with strategic goals, and offer personnel with proper training and support. In order to fully use the potential of information technologies and achieve strategic success, effective governance and leadership are essential.

REFERENCES

[1] K. Laudon and J. Laudon, “Information Systems, Organizations, and Strategy,” *Manag. Inf. Syst.*, 2012.

[2] K. M. Shibu, “Knowledge Management and Information System: Strategies for Growing Organizations,” *J. Knowl. Commun. Manag.*, 2012, doi: 10.5958/j.2277-7938.2.1.007.

[3] C. Price, W. Green, and O. Suhomlinova, “Twenty-five years of national health IT: Exploring strategy, structure, and systems in the English NHS,” *J. Am. Med. Informatics Assoc.*, 2019, doi: 10.1093/jamia/ocy162.

[4] R. D. Banker and R. J. Kauffman, “The Evolution of Research on Information Systems: A Fiftieth-Year Survey of the Literature in Management Science,” *Management Science*. 2004. doi: 10.1287/mnsc.1040.0206.

[5] N. Jiang, X. Zhao, and J. Zhang, “An empirical study on the impact of information system absorption on the performance of troops’ logistics organization,” *Cluster Comput.*, 2019, doi: 10.1007/s10586-017-1516-x.

[6] Y. K. Dwivedi *et al.*, “Impact of COVID-19 pandemic on information management research and practice: Transforming education, work and life,” *Int. J. Inf. Manage.*, 2020, doi: 10.1016/j.ijinfomgt.2020.102211.

[7] C. S. Osborn, “Systems for sustainable organizations: Emergent strategies, interactive controls and semi-formal information,” *J. Manag. Stud.*, 1998, doi: 10.1111/1467-6486.00106.

[8] V. S. Lai, "The information system strategies of MNC affiliates: A technology-organization-environment analysis," *J. Glob. Inf. Manag.*, 2008, doi: 10.4018/jgim.2008070104.

[9] R. Palanisamy, A. Anir Norman, and M. Laiha Mat Kiah, "Journal of Computer Information Systems BYOD Policy Compliance: Risks and Strategies in Organizations BYOD Policy Compliance: Risks and Strategies in Organizations," *Taylor Fr.*, 2020.

[10] D. Boddy, A. Boonstra, and G. Kennedy, *Managing Information Systems: Strategy and Organisation*. 2009.

CHAPTER 9

UNDERSTANDING OF INFORMATION SYSTEMS: AN ANALYSIS

Ms. Leena George
Assistant Professor, Master in Business Administration (General Management),
Presidency University, Bangalore, India.
Email Id: leenageorge@presidencyuniversity.in

ABSTRACT:

The design and understanding of information systems have significant implications for organizations in today's digital age. This abstract provides an overview of the implications and considerations for designing and understanding information systems, highlighting their importance, characteristics, and the benefits they offer to organizations. Information systems play a critical role in facilitating the collection, processing, storage, and dissemination of information within organizations. They support various functions, such as data management, communication, collaboration, and decision-making. The design of information systems is a multidimensional process that involves technological considerations, user needs, organizational context, and strategic objectives. Theories based on the sociology of complex organizations can help explain how and why businesses evolve when new IT applications are implemented. Large, bureaucratic companies, many of which date back to the pre-computer era, are often ineffective, slow to adapt, and less competitive than freshly founded ones.

KEYWORDS:

Agile Development, Cybersecurity, Data Governance, Human-Computer Interaction, Information Architecture, Knowledge Management, Mobile Computing.

INTRODUCTION

The number of workers and levels in some of these huge firms' organizational structures have been reduced. Information technology, according to the theories of behavioral researchers, facilitates the flattening of hierarchies by increasing the availability of information to lower-level workers and improving managerial effectiveness. Because lower-level workers have the knowledge they need to make judgments without supervision, IT drives decision-making authority downward in the company. Fewer managers are needed since decision-making is now lot quicker thanks to managers receiving considerably more reliable information on time. As a proportion of sales, management expenses decrease, and the hierarchy becomes much more effective. By empowering lower-level employees with greater decision-making power and giving managers the knowledge they need to manage bigger teams of employees, information technology may help organizations have fewer layers of management. Due to these modifications, high-level supervisors are now able to oversee and exercise control over a larger number of employees who are dispersed across longer distances. As a consequence of these modifications, several corporations have fired thousands of middle managers [1]–[3].

Postindustrial Businesses

The idea that IT should flatten hierarchies is also supported by postindustrial ideas that place a greater emphasis on history and sociology than on economics. Authority in postindustrial society increasingly depends on knowledge and skill rather than only formal positions. As a result of professional employees' propensity for self-management and the flattening of organizational shapes, decision-making should become more decentralized as knowledge and

information permeate across the company. Information technology may promote task force-networked companies where experts collaborate in small groups either physically or virtually for a short time to complete a single assignment before joining other task forces. One example is the multinational consulting firm Accenture. A large portion of its 246,000 workers travel between offices to work on projects at clients' sites in more than 120 nations.

Who monitors self-managed teams to make sure they don't go in the wrong direction? Who makes the decisions about who joins which teams and for how long? How can managers assess the success of someone who switches teams frequently? How do individuals choose the direction of their careers? There is a need for new strategies for organizing, assessing, and educating employees, and not all businesses can effectively manage virtual labor. Recognizing Organizational Change Resistance Information systems are always entangled in organizational politics because they affect who has access to information, a crucial resource. Who does what to whom, when, where, and how inside an organization may all be impacted by information systems. Many new information systems need adjustments to daily routines that may be difficult for people involved and require extra training and work that may or may not be reimbursed. When information systems are introduced, there is sometimes a lot of opposition since they have the ability to alter an organization's structure, culture, business processes, and strategy.

There are several methods for representing organized opposition. The nature of the IT innovation, the company's structure, the culture of people in the organization, and the tasks touched by the innovation are four elements that, according to research on organizational resistance to innovation, are crucial. Here, organizational work arrangements, structures, and people take in, interpret, deflect, and combat technological innovations. According to this approach, changing technology, tasks, structures, and people all at once is the only way to effect change. Before introducing an innovation, several writers have discussed the necessity to "unfreeze" organizations in order to swiftly execute it before "refreezing" or institutionalizing the change. Since organizational resistance to change is so strong, many investments in information technology fail and do not boost productivity. In fact, research on project implementation failures shows that organizational and political resistance to change, rather than a failure of the technology, is the most frequent cause of big projects failing to achieve their goals.

Organizations and the Internet

The World Wide Web in particular has a significant influence on how many businesses interact with other external organizations, as well as how internal business procedures are structured. Organizations may now access, store, and distribute information and expertise more easily thanks to the Internet. In summary, the transaction and agency expenses that most firms face may be significantly reduced through the Internet. For instance, by placing their internal operating procedures manuals on the company website, brokerage companies and banks in New York may now transmit them to their workers who work in remote places, saving millions of dollars in distribution expenses. Using the Web or management's e-mails, a worldwide sales force may get practically real-time updates on product pricing information. Some big retailers provide vendors direct access to their internal Web sites where they may see the most recent sales data and immediately place replenishment orders. Some of the most important business processes are being quickly rebuilt by companies using Internet technology, which is also becoming an important part of their IT infrastructures. If historical networking is any indication, this time around's businesses will be substantially flatter, with fewer people and simpler corporate procedures.

DISCUSSION

Information systems must be developed with a thorough knowledge of the organization in which they will be utilized if they are to provide meaningful advantages. According to our expertise, the following are the main organizational variables to take into account while building a new system:

The Use of Information Systems to Obtain A Competitive Edge

Almost every sector you look at has some businesses that do better than the majority. There is nearly always a corporation that stands out. Toyota is regarded as an industry leader in the automobile sector. Amazon is the market leader in pure online retail, whereas Walmart, the biggest retailer in the world, is the market leader in pure offline retail. With more than 70% of all digital music sales globally, Apple's iTunes is regarded as the market leader in online music, and the iPod is the market leader in the related field of digital music players. Google is regarded as the market leader for web searches. Companies that "do better" than their competitors are considered to have a competitive advantage over them because they either have access to unique resources that others lack or are able to employ resources that are widely accessible more effectively typically because to superior knowledge and information assets. In any case, they outperform their rivals in terms of revenue growth, profitability, or productivity growth, all of which eventually result in greater stock market values. However, what makes certain businesses more successful than others, and how can they get a competitive edge? How can a company be analyzed to determine its competitive advantages? How can you create a competitive edge for your own company? Moreover, how can information systems support tactical advantages? Michael Porter's competing forces model provides one response to that question [4]–[6].

Porter's Model of Competitive Forces

Michael Porter's competitive forces model is perhaps the most popular paradigm for comprehending competitive advantage. This model gives a broad overview of the company, its rivals, and its surroundings. We already discussed the significance of a firm's environment and how dependent enterprises are on surroundings. The whole business environment of the organization is crucial to Porter's model. In this concept, the firm's future is shaped by five competing factors.

Conventional rivals

All businesses compete for the same market space with rivals who are always coming up with new, more effective methods to create via the introduction of new goods and services, as well as trying to draw clients through the development of their brands and the imposition of switching costs.

Newcomers to the Market

A free economy with migratory labor and financial resources results in the constant emergence of new businesses. Entry is quite challenging in certain businesses while it is relatively low-barrier in others. The strategic position of the company and its strategies are influenced by four additional forces in the industry's environment, including new market entrants, substitute products, customers, and suppliers, according to Porter's competitive forces model.

Alternative Goods and Services

There are alternatives that your clients could choose if your costs rise too much in almost every business. Every day, new technologies give rise to new replacements. Even oil has alternatives,

such as ethanol for automobile fuel, vegetable oil for diesel in trucks, and wind, sun, coal, and hydropower for the production of industrial energy. Similar to how fiber-optic telephone connections to the house might replace cable TV lines, Internet telephone service can take the place of conventional telephone service. A replacement for CD-based music retailers is, of course, an Internet music service that enables you to download songs to an iPod. Your ability to regulate price and your profit margins decrease when there are more competing goods and services in your market.

Customers

A professional business relies heavily on its capacity to draw in new clients, keep existing ones happy, and demand high charges. Customers have more clout if they have an easy time switching to a competitor's goods and services or if they can pressure a company and its rivals to fight only on price in a market where prices are readily available and there is minimal product differentiation. For instance, students may locate several vendors of almost any current college textbook on the used college textbook market on the Internet. Online clients have exceptional leverage over secondhand book companies in this situation.

Suppliers

The ability of suppliers to increase prices more quickly than the company can may have a substantial influence on the earnings of the company. A company may have more influence over suppliers in terms of pricing, quality, and delivery schedules the more diverse its suppliers are. For instance, laptop PC makers nearly usually have a number of rival vendors for essential components like keyboards, hard drives, and display panels.

Strategies For Using Information Systems To Control Competitive Forces

What should a company do in the face of so many competing forces? And what information systems might the company employ to combat some of these forces? How can you stop replacements and stop new competitors from entering the market? There are four general tactics: low-cost leadership, product differentiation, market niche emphasis, and tightening relationships with customers and suppliers. Each of these strategies is often made possible by information technology and systems.

The goods that have sold and need reordering are identified using sales data gathered at the checkout counter by supermarkets and big-box retailers like Walmart. Walmart's suppliers get orders to resupply through its continuous replenishment system. Walmart can control expenses using the technology while adjusting its product to better match consumer needs.

Cheap Leadership

To obtain the lowest operating expenses and prices, use information systems. The standard illustration is Walmart. Walmart rose to the top of the retail food chain in the United States by maintaining cheap pricing and a full supply of products on the shelves utilizing a renowned inventory replenishment system. As soon as customers pay for their goods at the register, Walmart's continuous replenishment system immediately sends orders for additional products to suppliers. Each item's bar code is recorded by point-of-sale terminals as it passes the checkout counter, and a purchase transaction is sent straight to a central computer in Walmart's corporate offices. The orders are gathered by the computer from every Walmart location and sent to suppliers. Suppliers may use Web technologies to access Walmart's sales and inventory information.

Because the system replaces inventory so quickly, Walmart doesn't have to spend a lot of money keeping a lot of inventory in its own warehouses. In order to accommodate client wants, Walmart is also able to modify shop item purchases thanks to the technology. Competitors have been allocating 24.9 percent of revenue to overhead, like Sears. However, Walmart only spends 16.6% of sales income on overhead thanks to technologies that keep operational expenses low. Another good example of a consumer response system is Walmart's continuous replenishment system. An effective customer response system closely connects supply, manufacturing, and distribution networks with consumer behavior. The technique of constant replenishment at Walmart offers such effective customer service.

Differentiation of Products

Use information systems to enable new goods and services or significantly improve the ease of use for customers of your current offerings. As an example, Google often launches brand-new and distinctive search services on its website, like Google Maps. By acquiring PayPal, an electronic payment system, in 2003, eBay facilitated the payment of sellers by buyers and increased the popularity of its auction platform. Apple developed the iPod, a special digital music player for portable devices, as well as iTunes Match, a special online Web music service where tracks may be bought for between $.69 and $1.29 apiece. With its multimedia iPhone, iPad mobile computer, and iPod video player, Apple has maintained its innovative edge.

Information systems are being used by manufacturers and merchants to design goods and services that are individualized and tailored to each individual customer's exact requirements. For instance, Nike offers personalized footwear on its website via its Inked program. The style of shoe, colors, materials, outsoles, and even a logo with up to eight letters are all options for the customer. Nike transmits the orders to specially equipped facilities in China and Korea using computers. The customer must wait roughly three weeks to get the footwear, which are just $10 more expensive. Mass customization refers to the capacity to provide uniquely customized goods or services while using the same manufacturing resources as mass production [7]–[10].

Consider Market Niches

Utilize information systems to provide a focused market approach and outperform rivals in serving this particular target market. In order to produce and analyze data for specialized sales and marketing tactics, information systems assist this strategy. Information systems provide businesses the ability to thoroughly examine client purchasing habits, interests, and tastes in order to effectively target ever-tinier target audiences with advertising and marketing campaigns. Credit card transactions, demo- graphic data, purchase data from checkout counter scanners at supermarkets and retail establishments, and data gathered when individuals visit and interact with websites are just a few of the sources of the data. In these vast data sets, sophisticated computing tools look for patterns and derive rules to help people make decisions. One-to-one marketing, which develops personalized messaging based on individual preferences, is driven by the analysis of such data. For instance, the On system of Hilton Hotels analyzes comprehensive data on current visitors across all of its hotels to identify each guest's preferences and profitability. With the use of this information, Hilton may provide its most valuable clients special benefits like late checkouts. Systems for managing client relationships now include the analytical tools necessary for this kind of detailed data analysis.

This method enables credit card firms to anticipate their most profitable consumers. The businesses acquire a ton of information about customer purchases and other habits, then analyze it tremendous create extensive profiles of cardholders who could pose either good or negative credit risks.

Increased Trust between Customers and Suppliers

Utilize information systems to fortify connections with suppliers and foster closeness with clients. Information systems are used by Chrysler Corporation to provide suppliers' direct access to production schedules. Suppliers are even given the freedom to choose how and when to deliver materials to Chrysler plants. This gives suppliers more time to produce things in advance. On the user end, Amazon maintains track of user preferences for book and CD purchases and may suggest books to its consumers based on what other users have bought. Strong relationships with consumers and suppliers reduce switching costs and boost brand loyalty.

Impact of the Internet on Competitive Advantage

The classic competitive pressures are still in play thanks to the Internet, but the level of competition has significantly increased. Due to the universal standards that underpin internet technology, it is simple for rivals to compete only on price and for new competitors to join the market. Internet users have more negotiating power since they have access to more information and can easily pick the most affordable provider.

Starbucks Uses Technology to Find New Ways to Compete

With more than 1,700 coffee shops spread over 55 countries, Starbucks is the biggest specialty coffee retailer in the world. For many years, Starbucks expanded both domestically and abroad, creating franchisees at a remarkable pace. The business alone increased the number of outlets it operated internationally between 2002 and 2007. Starbucks provides a distinctive experience with its high-end specialty coffees and drinks, skilled and courteous baristas, and welcoming coffee shops. For many years, this formula worked well and allowed Starbucks to charge higher pricing. Profits fell dramatically during the economic slump that started in 2008. Customers said the business had lost its cool, neighborhood vibe and had started to resemble a fast-food franchise. For their coffee fix, many coffee consumers looked for less expensive options like McDonald's and Dunkin' Donuts. By the end of 2008, Starbucks stock had lost nearly 50% of its value.

Major adjustments were required

Starbucks took advantage of the chance to transform its company by implementing numerous initiatives at once. First, the firm has updated its in-store technology and worked to incorporate wireless technology and the mobile digital platform into its business operations. Additionally, Starbucks developed a more aggressive product differentiation approach in order to highlight the great quality of their products and their effective and friendly customer service, as opposed to just copying the tactics of rivals. However, Starbucks also put a lot of effort into being "lean," similar to many of its rivals, and removing inefficiencies wherever it might be. Starbucks discovered that more than a third of its patrons actively use cellphones when it set out to enhance the customer experience. The business decided to introduce a number of features and enhancements that would appeal to this consumer base. Starbucks first introduced a system that enables consumers to pay using a smartphone app. The app is connected with the Starbucks Card system, which enables frequent customers to make payments at any Starbucks location using a pre-paid and rechargeable card. Customers use the app to make purchases, which are then charged to their Starbucks Card account once the cashier scans a bar code shown on the customer's phone. Customers claim that using this app, which is compatible with all major smartphone operating systems, to pay is significantly quicker than using more conventional methods of payment. The Starbucks mobile payment system handled 42 million transactions in the first 15 months of operation.

Many of Starbucks' most devoted customers often use the free Wi-Fi network provided at each location. Most of these clients connect to the in-store Wi-Fi networks using their mobile devices as well. Starbucks saw this and created the "Starbucks Digital Network," a gateway made exclusively for mobile devices rather than standard Web browsers. The site is responsive to multi-touch capabilities on devices like the iPad and is designed for all popular smartphone operating systems. The Starbucks Digital Network website serves as a content gateway and was created in collaboration with Yahoo. Customers of Starbucks who use the website will get free access to the Wall Street Journal, some free iTunes downloads, and a broad range of other material. Foursquare will be integrated into the website.

A mobile social networking platform with a location-based focus. Users will be able to utilize Starbucks' website to check in and collect reward points thanks to this deal. Customers like this function since Starbucks has the most foursquare check-ins of any business to date. Starbucks has chosen not to run advertisements on the website in the hopes that securing arrangements with content providers would turn it into a profitable enterprise. Even if the Starbucks Digital Network is not very profitable, experts claim that the website is a clever use of the mobile digital platform to raise customer happiness and a successful approach for Starbucks to strengthen its connection with its most important clients.

Starbucks has made a determined effort to improve efficiency, cut waste, and utilize the time saved to better serve customers in addition to redesigning their company to better meet the demands of its mobile users. Starbucks sought to simplify the operational procedures employed in each of its retail locations so that baristas would not have to stoop to scoop coffee, reducing idle time. Reducing the time it takes for each employee to make a cup, and the time spent waiting for the coffee to drain. A 10-person "lean team" was formed by Starbucks with the purpose of traveling the nation to franchise locations and imparting the lean manufacturing principles made popular by Toyota's production method.

Starbucks spends around $2.5 billion on store labor annually, or 24% of its total earnings. If Starbucks can cut down on the amount of time each person spends creating a drink, it will be able to produce more beverages with the same number of employees or perhaps less. As an alternative, Starbucks may use this time savings to allow baristas greater opportunity to engage with clients, therefore enhancing the Starbucks experience. Starbucks' efforts to streamline its business processes were aided by wireless technology. Starbucks district manager’s link to the company's proprietary corporate network and systems via the in-store wireless networks to supervise retail operations.

For this, Starbucks district managers have computers with Wi-Fi capabilities. Before the in-store networks were put in place, a district manager who was in charge of around 10 locations had to go to a Starbucks regional office to submit reports and send emails. While there, they had to visit each store, assess its operations, and create a list of things to follow up on.

Starbucks district managers are able to do the majority of their business while seated at a desk at one of the shops they are in charge of, as opposed to working from offices in regional headquarters. Going back and forth to regional offices would take time that might be spent observing how personnel are servicing clients and improving their training. Without hiring any more managers, Starbucks was able to enhance the in-store presence of district managers by 25% by using Wi-Fi technology. Starbucks was compelled by the terrible economy in 2008 and 2009 to shut 900 locations, renegotiate some leases, lower pricing on some of their most expensive goods, and start promoting price-reduced specials like a breakfast sandwich and a drink for $3.95. These lower rates were made possible for Starbucks because to procedural modifications that reduced costs.

These methods have previously been employed by large fast-food restaurants. While some baristas have opposed the changes and experts were dubious about their ability to stick, Starbucks credits its recent upswing in profitability in large part to its attempts to become leaner. Starbucks CEO Howard Schultz said that "the majority of cost reductions we've achieved come from a new way of operating and serving our customers," and he noted that the firm was also able to increase consumer engagement because to the time and money saved. Due in significant part to the success of each of these adjustments, Starbucks returned to profitability in 2011 and continued to develop, with plans to add 500 new shops.

CONCLUSION

In conclusion, for businesses, the conception and comprehension of information systems have broad ramifications. Operational effectiveness, decision-making, and overall organizational performance may all be improved by well-designed systems that are in line with corporate objectives, emphasize usability, and take security and privacy issues into account. A thorough grasp of information systems helps businesses to make the most use of technology, change with the times, and foster innovation.

Organizations may succeed in the digital age by embracing the implications of information systems design and understanding. Companies must prepare for and deal with employee resistance to change, provide training and assistance, and promote a culture that welcomes technology adoption and creativity.

REFERENCES

[1] D. A. Tamburri, “Design principles for the General Data Protection Regulation (GDPR): A formal concept analysis and its evaluation,” *Inf. Syst.*, 2020, doi: 10.1016/j.is.2019.101469.

[2] S. Seidel, J. Recker, and J. Vom Brocke, “Sensemaking and sustainable practicing: Functional affordances of information systems in green transformations,” *MIS Q. Manag. Inf. Syst.*, 2013, doi: 10.25300/MISQ/2013/37.4.13.

[3] C. Tam, A. Loureiro, and T. Oliveira, “The individual performance outcome behind e-commerce: Integrating information systems success and overall trust,” *Internet Res.*, 2020, doi: 10.1108/INTR-06-2018-0262.

[4] M. Prestes Joly, J. G. Teixeira, L. Patrício, and D. Sangiorgi, “Leveraging service design as a multidisciplinary approach to service innovation,” *J. Serv. Manag.*, 2019, doi: 10.1108/JOSM-07-2017-0178.

[5] G. Marchionini, “Search, sense making and learning: closing gaps,” *Information and Learning Science*. 2019. doi: 10.1108/ILS-06-2018-0049.

[6] S. Bødker, “Activity Theory as a Challenge to Systems Design,” *DAIMI Rep. Ser.*, 1990, doi: 10.7146/dpb.v19i334.6564.

[7] D. Mateo, N. Horsevad, V. Hassani, M. Chamanbaz, and R. Bouffanais, “Optimal network topology for responsive collective behavior,” *Sci. Adv.*, 2019, doi: 10.1126/sciadv.aau0999.

[8] B. Brown, P. Balatsoukas, R. Williams, M. Sperrin, and I. Buchan, “Multi-method laboratory user evaluation of an actionable clinical performance information system: Implications for usability and patient safety,” *J. Biomed. Inform.*, 2018, doi: 10.1016/j.jbi.2017.11.008.

[9] L. L. Novak *et al.*, "Understanding the information needs and context of trauma handoffs to design automated sensing clinical documentation technologies: Qualitative mixed-method study of military and civilian cases," *J. Med. Internet Res.*, 2020, doi: 10.2196/17978.

[10] A. M. Turner, M. K. Brownstein, K. Cole, H. Karasz, and K. Kirchhoff, "Modeling workflow to design machine translation applications for public health practice," *J. Biomed. Inform.*, 2015, doi: 10.1016/j.jbi.2014.10.005.

CHAPTER 10

APPLICATION OF THE BUSINESS VALUE CHAIN MODEL

Dr. Kadambat Kumar
Professor, Master in Business Administration (General Management),
Presidency University, Bangalore, India.
Email Id: krishnakumark@presidencyuniversity.in

ABSTRACT:

The business value chain model is a conceptual framework that helps organizations understand and analyze the various activities that create value within their operations. This abstract provides an overview of the business value chain model, its components, and its significance in driving organizational success. The value chain model identifies certain corporate operations where it is most advantageous to use competitive tactics and where information systems are most likely to have a strategic influence. This methodology pinpoints precise, crucial leverage points where a company may utilize IT most efficiently to strengthen its competitive advantage. According to the value chain concept, a company is composed of a number of fundamental tasks that together give value to its goods and services. Either main activities or support activities may be applied to these activities. The business value chain model consists of a series of interrelated activities that transform inputs into valuable outputs. It encompasses both primary activities, which directly contribute to the production and delivery of goods or services, and support activities, which provide the necessary infrastructure and resources to facilitate the primary activities.

KEYWORDS:

Outbound Logistics, Marketing And Sales, Service, Primary Activities, Support Activities, Customer Value.

INTRODUCTION

The Porter model is quite useful for detecting competitive forces and providing general tactics, but it is not particularly detailed about what to do specifically, and it does not provide a process to follow for gaining competitive advantages. Where do you begin if operational excellence is your aim? The company value chain model comes in handy in this situation. The value chain model identifies certain corporate operations where it is most advantageous to use competitive tactics and where information systems are most likely to have a strategic influence. This methodology pinpoints precise, crucial leverage points where a company may utilize IT most efficiently to strengthen its competitive advantage. According to the value chain concept, a company is composed of a number of fundamental tasks that together give value to its goods and services. Either main activities or support activities may be applied to these activities. Examples of systems for both main and supporting operations of a business and its value partners are shown here. These systems may add a margin of value to a firm's goods or services.

The creation and distribution of the business's goods and services, which provide value for the client, are the primary operations. Operations, outbound logistics, sales and marketing, and service are among the main tasks. Receiving and storing commodities before distributing them to manufacturing are included in inbound logistics. Operations turn raw materials into final goods. Finished goods must be stored and distributed as part of outbound logistics. Promoting and selling the company's goods are included in sales and marketing. The company's products and services are maintained and repaired as part of the service activity [1]–[3].

Support activities, which include organizational infrastructure, human resources, technology, and procurement, enable the implementation of the principal activities. Now, you may ask, "How can we use information systems to improve operational efficiency and improve customer and supplier intimacy?" at each level of the value chain. You'll be forced to consider how you do value-adding tasks at each level and how the business processes could be enhanced as a result of this. Additionally, you might start to consider how information systems could be utilized to enhance interactions with clients and suppliers who are not part of the company's traditional value chain but are nonetheless vital to the company's overall performance. Two of the most popular system applications that come from a business value chain analysis are supply chain management systems, which coordinate the flow of resources into your company, and customer relationship management systems, which coordinate your sales and support staff with customers.

Utilizing the business value chain model can also prompt you to think about comparing your company's operations to those of your rivals or those in adjacent fields and locating industry best practices. Benchmarking is comparing the efficacy and efficiency of your company's operational procedures to exacting standards, and then gauging performance in relation to those criteria. Consulting firms, research groups, governmental organizations, and industry associations often identify industry best practices as the most effective solutions or problem-solving techniques for consistently and successfully attaining a corporate target.

After you have examined the different steps in your company's value chain, you may think of potential information system applications. Once you have a list of potential applications, you may choose one to start working on first. You may get a competitive edge by achieving operational excellence, reducing expenses, increasing profit margins, and establishing tighter ties with clients and suppliers. This is done by implementing changes to your own company's value chain that your rivals might overlook.

The best case scenario would be if your rivals were also making comparable advancements, in which case you would not be at a competitive disadvantage. We can see how value chain analysis may have aided manufacturers in honing their competitive strategies in the Interactive Session on Technology. By providing software interfaces and applications for enhancing vehicle performance, providing entertainment, integrating with other systems for maintenance, and allowing for future traffic management, Ford, GM, and other top manufacturers are enhancing the value of their cars.

How may information systems be used to a certain industry to gain a strategic advantage? Industry players may utilize information technology to collaborate with other businesses to create industry-wide standards for electronically exchanging information or doing business that compel all market participants to adhere to the same standards. By increasing efficiency and perhaps boosting entry costs, such initiatives discourage new entrants by decreasing the likelihood of product replacement. In order to coordinate operations involving government agencies, international competition, and competitive industries, industry participants may also create industry-wide, IT-supported consortia, symposia, and communications networks.

The industrial value chain urges you to consider how information systems might be used to connect with your suppliers, key partners, and consumers more effectively. Your ability to connect your value chain to the value chains of other participants in the process will provide you a strategic edge. If you are Amazon.com, you could wish to develop systems that: Another sector has started becoming "smarter" using software and apps: the automotive industry. This development coincides with the continued growth of the smartphone market and the popularity of efforts like smart electric grids. The automotive industry is developing technology that will

enable car management through the cloud, and Ford, BMW, and other automakers are improving their vehicles with on-board software that enhances the consumer experience.

Software is now being used by automakers as a technique to increase the "value" and "freshness" of their products without making as much of an investment in the creation of brand-new vehicles. For instance, it takes Ford Motor Company around 2.5 years to conceptualize, develop, and construct a new automobile. Long before the automobile comes off the assembly line, design and manufacture, including the metal stamping machinery and assembly line setup, must be completed. However, auto manufacturers may develop a new software interface for a car in a matter of months and update it continuously for the life of the vehicle without much lead time. Ford and other manufacturers may take use of this to greatly enhance the driving experience and add new features to automobiles years after they are produced.

Ford is reportedly the carmaker using software and applications to innovate the most. Select Ford cars include an in-dash touch screen with the My Ford Touch interface, which includes controls for navigation, music, phone integration, and temperature. Ford has improved this user interface and the Sync software that powers it, adding telecommunications and smartphone connectivity as well as improved voice response. 2010 saw Ford implement compatibility for Pandora, a well-liked internet music service among youthful prospective customers. With this upgrade, drivers may use voice commands to access music and other programs on their test and smartphones that are connected to the Sync system.

By investing in technology that addresses the issues caused by traffic in the largest cities, Chairman Bill Ford Jr. has pushed for the use of software to reduce urban congestion. Theoretically, technology may assist vehicles in avoiding traffic, reserving parking spots in advance, and even perhaps driving themselves. In order to achieve this, vehicles must be linked to a centralized system that coordinates with other modes of transportation and public transportation, and to do this, vehicles must be fitted with software that can monitor and improve even the most fundamental aspects of vehicle performance. The ultimate solution would call for vehicles to provide systems designed to reduce traffic congestion with ever-increasing volumes of information. Additionally, the system would need an industry standard, which is not currently available. BMW is also continuing to work on methods for cars to interact with one another on the road in order to minimize crashes, while Ford has increased its investment in vehicle-to-vehicle communication systems.

Automobile manufacturers are exploring unknown ground by integrating software into their vehicles. They now need to invest resources in testing and upgrading their software as well as developing strategies for distributing the new software to their clientele. The development cycles for cars and software should be more tightly synchronized in the automotive industry. Additionally, many of the technologies included in software packages for automobiles create the same privacy issues with regard to location monitoring that often bother smartphone manufacturers and app developers. Ford is debating how to provide software updates to its customers in the most effective manner. 250,000 customers whose vehicles feature sophisticated touch screen control panels using the My Ford Touch interface have received USB sticks in the mail from the business. A software update on the stick will enhance the phone, audio, and temperature controls in the vehicle, as well as the navigation functions. Additionally, the patch includes code that will increase system performance and enhance the user interface in response to frequent complaints from Ford owners.

Ford says it will continue to provide software updates in this manner, but it wants consumers to develop the habit of checking the Ford website often for updates. The majority of car owners

are used to the technology in their vehicles being the same throughout the course of the vehicle, but newer vehicles are ready to disrupt all of that [4]–[6].

Ford has employed "human-machine interface engineers," whose responsibility it is to examine how users interact with the car's software. These developers often modify the program based on consumer input. Ford responded to customer complaints that there was too much information accessible on each page of the interface by moving the most frequently used elements to more prominent locations and enlarging their text size, pushing the remainder to submenus. The response has been favorable. In order to assist consumers comprehend its interface, Ford has also requested that dealers devote more time and resources to hands-on technology training. Companies like GM, Daimler, and others are all working on new cloud-based internet services for their vehicles. Users will have the ability to follow their vehicles remotely and identify issues with them, such as low tire pressure or the need for an oil change.

Employers will be able to monitor employee usage of business vehicles by analyzing engine readouts and car sensors. The data from consumers' automobiles will be combined and analyzed by manufacturers so they can find quality issues and, if necessary, rapidly issue recalls. The only restriction is the manufacturers' creativity, much as with applications. In order to enhance the functionality of its apps, GM will provide access to its computer systems to its app developers, raising the usual privacy issues. As automakers learn how to correctly manage sensitive consumer data and give comprehensive privacy alternatives, researchers predict that companies will make errors. Automakers, on the other hand, are betting that younger consumers who grew up using Facebook would be less concerned with privacy and technologies that gather highly targeted data about a car's location and driving behavior.

BMW is also making a massive $100 million investment in mobile applications with the intention of selling them to its users as "premium services." Although some experts question the wisdom of spending so much money, BMW is certain that owners of its Bow electric and hybrid vehicles will find smartphone applications to be an increasingly compelling selling feature. Automakers are enthused by the potential offered by smart software and applications, even if exchanging information with other adjacent automobiles is still years away.

DISCUSSION

Synergies, Core Competencies, and Network- Based Strategies

A huge firm is often made up of several companies. Financially, the company is often structured as a group of key business units, and the success of each of these divisions directly affects the firm's profits. By encouraging synergies and core competences, information systems may enhance these business divisions' overall performance.

Synergies

The concept of synergy states that when two companies combine their markets and knowledge or when certain units' product may be utilized as an input by other units, these interactions reduce costs and increase revenues. Recent bank and financial business mergers, such as those between Bank of America and Countrywide Financial Corporation and JPMorgan Chase and Bank of New York, happened specifically for this reason. Information technology may be used in these synergy scenarios to coordinate the activities of several corporate units so that they can function as one. For instance, by purchasing Countrywide Financial, Bank of America was able to expand its mortgage lending division and reach a sizable new client base that would be interested in its consumer banking, credit card, and other financial services. Information

technology would assist the combined businesses in streamlining operations, reducing retail expenses, and boosting cross-selling of financial products.

Improvement of Core Competencies

Consider ways that systems may improve fundamental capabilities as yet another method to employ information systems for competitive advantage. The claim is that when each business unit develops or creates a central core of skills, the performance of each business unit will improve. A company's core competence is an endeavor in which it excels. Being the world's finest maker of thin-film products, package delivery service, or small components designer are examples of core competences. A core competence often depends on knowledge acquired over many years of hands-on experience working with a technology. The usual additions to this practical expertise include a sustained study effort and dedicated staff. Competency is improved by any information system that promotes knowledge transfer across corporate divisions. Such technologies might promote or improve already-existing abilities, assist staff in learning about fresh external information, and assist a company in leveraging such talents in connected markets.

In order to strengthen its core capabilities, Procter & Gamble, a global leader in brand management and consumer product innovation, utilizes a number of systems. Innovation Net is an intranet that promotes knowledge sharing among those tackling related issues. Using a gateway to provide browser-based access to papers, reports, charts, videos, and other data from many sources, Innovation Net links persons working in research and development, engineering, buying, marketing, legal affairs, and corporate information systems globally. It also provides access to outside research scientists and entrepreneurs who are looking for fresh, unique goods throughout the globe, as well as a directory of subject matter experts that can be consulted for guidance or to work together on problem-solving and product creation.

Networked Approaches

Strategies that profit from businesses' capacity to build networks or network with one another were inspired by the availability of the Internet and networking technologies. A virtual firm model, business ecosystems, and network economics are all examples of network-based tactics. Internet Economics. Network-based business models may aid organizations strategically by using network economics. Production encounters declining returns in conventional economics, which governs industries like manufacturing and agriculture. Up to a point when the extra inputs yield no further outputs, the marginal increase in output of any given resource decreases with increasing application to production. This principle, known as the rule of diminishing returns, is the cornerstone of much contemporary economics [7]–[10].

The rule of diminishing returns may not always apply. In a network, for instance, the marginal costs of bringing on a new person are about zero, but the marginal return is significantly higher. A telephone system or the Internet will be more valuable to all users if there are more subscribers since each user will be able to communicate with more users. Operating a television station with 1,000 subscribers is not much more costly than one with 10 million. A community's worth increases with growth, but the expense of bringing in new members is negligible.

This network economics viewpoint suggests that information technology has potential strategic applications. Businesses may utilize websites to create user communities made up of like-minded consumers who wish to exchange experiences. This fosters strong bonds with clients and increases consumer satisfaction and loyalty. Examples include village, an online community for women, and the enormous online auction site eBay. Both corporations have leveraged the Internet and its communication capabilities to create communities, and both are

founded on networks of millions of members. The more sellers there are on eBay, the more beneficial the site is to everyone since there are more items posted and there is greater price rivalry among suppliers. Network economics offers commercial software companies additional strategic advantages. With a bigger installed base to enable continuous usage of the product and vendor maintenance, the value of their software and related software products rises as more people use them.

Model of a virtual company. Another network-based approach builds a competitive corporation using the virtual company paradigm. A virtual firm, sometimes called a virtual organization, links people, resources, and ideas through networks so that it may collaborate with other businesses to produce and deliver goods and services without being constrained by conventional organizational boundaries or geographical locations. Without being physically connected to that firm, one company might use the resources of another company. When a business finds it more cost-effective to purchase goods, services, or skills from an outside vendor or when it wants to act fast to take advantage of new market possibilities but lacks the time and resources to do so on its own, the virtual company model may be helpful.

Li & Fung from Hong Kong is hired by fashion firms including GUESS, Ann Taylor, Levi Strauss, and Reebok to oversee the manufacture and delivery of their clothing. Li & Fung is in charge of product creation, acquiring raw materials, manufacturing scheduling, quality control, and delivery. Li & Fung outsources all of its work to a network of more than 15,000 vendors in 40 different countries since it has no fabric, factories, or equipment of its own. Over its own extranet, Li & Fung accepts orders from customers. The factories where the apparel is made and the relevant raw material suppliers get instructions from Li & Fung. The whole manufacturing process for each order is tracked by the Li & Fung extranet. Since Li & Fung is a virtual business, it can quickly create and manufacture the things that customers request, keeping up with the continuously evolving fashion trends.

Keystone and niche firms in business ecosystems. The industry competitive forces model has to be modified in light of the Internet and the rise of digital businesses. The conventional Porter model concentrates on industry participants in a market context and assumes a relatively unchanging industrial environment, relatively distinct industry borders, and a very small collection of suppliers, alternatives, and consumers. Some of today's businesses are far more conscious that they operate in industry sets, which are groups of industries that provide similar services and goods, as opposed to just one industry. Another name for these loosely related yet interconnected networks of suppliers, distributors, and outsourcing is business ecosystem.

With rivalry happening across industry sets in a business ecosystem, the age of the digital firm necessitates a more dynamic understanding of the borders of industries, businesses, customers, and suppliers. To provide value to the client, several sectors collaborate under the ecosystem model. IT is crucial in allowing the participation enterprises to engage in a dense network. The notion of the value web is the foundation of the idea of a business ecosystem, with the primary distinction being that collaboration occurs across many sectors rather than many enterprises. For instance, platforms made up of information systems, technologies, and services are offered by both Walmart and Microsoft, which thousands of businesses in many sectors employ to improve their own capabilities. In order to supply their own goods, support Microsoft products, and increase the value of Microsoft's own company, Microsoft estimates that more than 40,000 businesses utilize its Windows platform. Thousands of vendors utilize Walmart's order entry and inventory management system as a platform to monitor consumer demand in real-time, track shipments, and manage stocks.

Business ecosystems may be described as consisting of one or a small number of keystone companies that rule the market and build the platforms that are used by other specialty companies. Microsoft is a cornerstone company in the Microsoft ecosystem, along with tech giants like Intel and IBM. Numerous niche companies that support and depend on Microsoft technologies include thousands of software application companies, software developers, service companies, networking organizations, and consulting firms. Business ecosystems are created in large part thanks to information technology. It goes without saying that many businesses leverage information systems to create platforms that other businesses may use, turning them into cornerstone businesses. We can anticipate a stronger focus on using IT to create industrial ecosystems in the age of the digital company since doing so will become more affordable and will have an immediate positive impact on all participating businesses.

Individual businesses should think about how their information systems will help them compete in more expansive ecosystems built by keystone companies. For instance, a company should think about the current business ecosystems connected to the goods it plans to produce or the services it will provide, as well as how it may leverage IT to facilitate participation in these bigger ecosystems. The mobile Internet platform is a potent contemporary illustration of a quickly developing ecosystem. Device manufacturers, wireless telecommunication companies, independent software application suppliers, and Internet service providers are the four businesses that make up this ecosystem. These industries each have their own histories, passions, and motivating factors. But these components combine to produce the mobile digital platform ecosystem, a new sector of the economy that is sometimes cooperative and occasionally competitive. Apple has been able to integrate various businesses into a system better than other companies. Apple's goal is to offer physical products that are almost as powerful as current personal computers. Only the high-speed broadband network provided by the wireless phone providers is compatible with these devices. The iPhone needed to be more than simply a mobile phone in order to draw in a sizable client base. Apple distinguished this device by turning it into a "smart phone," one that can run 700,000 various, practical apps. Apple was unable to create each of these programs by itself. Instead, these programs, which can be purchased through the iTunes store, are often made by small, independent software developers. Internet service providers, who profit anytime iPhone customers connect to the Internet, are in the backdrop.

Management Issue: Using Systems for Competitive Advantage

Strategic information systems often alter an organization's operations, goods, and services while also introducing new behavioral patterns. Using information systems to gain a competitive edge is difficult and requires careful management, organization, and technological coordination.

Keeping A Competitive Edge

Strategic systems may offer competitive advantages, but such benefits may not last long enough to guarantee sustained profitability. Competitive advantage is not always tenable since rivals might counterattack and steal strategic systems. Markets, consumer expectations, and technology all undergo continuous and unpredictable change; globalization has accelerated this process. Given that almost all businesses can utilize the Internet, competitive advantage may go very fast. Being the first in their fields helped established strategic systems like American Airlines' SABRE computerized reservation system, Citibank's ATM system, and FedEx's package tracking system. Then competing systems started to develop. Previously a market leader in e-commerce, Amazon is now up against eBay, Yahoo, and Google. Information systems by themselves are unable to sustain a competitive edge. Systems that were initially

designed with a strategic purpose often turn into instruments for survival, necessities for any company to remain in operation, or they may prevent businesses from making the strategic adjustments necessary for long-term success.

It's Alignment with Business Objectives

According to studies on IT and business performance, a company will be more profitable the more effectively it can match information technology with its corporate objectives. However, only one-quarter of companies succeed in doing this. Aligning IT with business may account for almost half of a company's profitability. Information technology takes on a life of its own and does not very effectively serve management and shareholder objectives, which is where most firms go wrong. Instead of actively molding IT for the organization, businesspeople disregard it, pretend they don't understand it, and accept IT failure as a minor inconvenience to be avoided. Poor performance comes at a high cost for these companies. Successful businesses and managers have a thorough understanding of its capabilities and workings, actively shape how it is used, and monitor how it affects sales and profitability. Checklist for Management: Conducting a Strategic Systems Analysis. Managers must conduct a strategic systems analysis in order to integrate IT with the company's operations and efficiently leverage information systems for competitive advantage.

Strategic Transitions Management

Adopting the sorts of strategic systems outlined in this often necessitates changes to organizational objectives, supplier and customer relationships, and operational procedures. These sociotechnical changes, which have an impact on both the social and technical aspects of the organization, may be seen as a transition between sociotechnical system levels. These developments often require the blending of internal and external organizational boundaries. Customers and suppliers should develop close relationships and may even share duties. In order to coordinate the operations of their businesses with those of customers, suppliers, and other organizations, managers will need to create new business processes. Because they are so crucial, the organizational transformation needs for new information systems warrant consideration throughout this article.

CONCLUSION

In conclusion, the business value chain model offers a thorough framework for comprehending the functions inside a company that provide value. Organizations may strengthen their competitive edge and promote economic success by examining and improving each activity's cost, efficiency, and contribution to value generation. Organizations may generate value for customers, achieve operational excellence, and accomplish sustainable development in today's changing business climate by integrating operations, working efficiently, and concentrating on customer value.

The business value chain model also underlines how crucial it is to comprehend consumer preferences and wants. Organizations may adjust their goods, services, and processes to satisfy consumer expectations by coordinating operations with customer value propositions. This focus on the needs of the client improves brand performance and customer happiness.

REFERENCES

[1] J. M. Sahut, L. P. Dana, and M. Laroche, “Digital innovations, impacts on marketing, value chain and business models: An introduction,” *Can. J. Adm. Sci.*, 2020, doi: 10.1002/cjas.1558.

[2] P. A. Jensen, "Business models in facilities management value chains," *J. Corp. Real Estate*, 2019, doi: 10.1108/JCRE-07-2019-0034.

[3] M. Tang, C. Li, A. Baskaran, Y. Cheng, and V. G. R. Chandran, "Reshaping the Business Incubator Model: The Case of the Value Chain Model of Innovation Works in China," *Sci. Technol. Soc.*, 2019, doi: 10.1177/0971721819873179.

[4] B. W. Wirtz, "Business models, value chains and competencies in media markets. A service system perspective," *Palabra Clave*. 2014. doi: 10.5294/pacla.2014.17.4.3.

[5] Z. Asikin, D. Baker, R. Villano, and A. Daryanto, "Business models and innovation in the Indonesian smallholder beef value chain," *Sustainability (Switzerland)*. 2020. doi: 10.3390/su12177020.

[6] S. Denicolai and P. Previtali, "Precision Medicine: Implications for value chains and business models in life sciences," *Technol. Forecast. Soc. Change*, 2020, doi: 10.1016/j.techfore.2019.119767.

[7] G. Roos, "Business model innovation to create and capture resource value in future circular material chains," *Resources*, 2014, doi: 10.3390/resources3010248.

[8] E. C. Brun, "Understanding a Business Incubator as a Start-Up Factory: A Value Chain Model Perspective," *Int. J. Innov. Technol. Manag.*, 2019, doi: 10.1142/S0219877019500251.

[9] M. J. Ávila-Gutiérrez, A. Martín-Gómez, F. Aguayo-González, and J. R. Lama-Ruiz, "Eco-holonic 4.0 circular business model to conceptualize sustainable value chain towards digital transition," *Sustain.*, 2020, doi: 10.3390/su12051889.

[10] P. D. G. Schaad, "Re-Combining Value Chains: Cross-Industry Cooperation for Business Model Innovation," *J. Bus. Model.*, 2018.

CHAPTER 11

IMPROVING DECISION MAKING TO CLARIFY BUSINESS STRATEGY

Mrs. Salma Syeda
Assistant Professor, Masters in Business Administration,
Presidency University, Bangalore, India.
Email Id: syeda.s@presidencyuniversity.in

ABSTRACT:

Effective decision-making is crucial for organizations to succeed in today's dynamic business environment. The importance of using a database to clarify business strategy and improve decision-making processes. By leveraging a database to collect, organize, and analyze relevant data, organizations can gain valuable insights and make informed strategic decisions. A database serves as a centralized repository of structured data, providing a platform for storing and retrieving information. By implementing a database system, organizations can capture and organize data related to various aspects of their business, including market trends, customer preferences, operational performance, and financial metrics. This data serves as a foundation for informed decision-making.

KEYWORDS:

Decision Support Systems, Key Performance Indicators (KIPS), Market Segmentation, Performance Metrics, Predictive Analytics, Strategic Planning, SWOT Analysis.

INTRODUCTION

In this exercise, you will utilize database software to examine a hotel's reservation transactions in order to improve the business strategy and marketing initiatives of the hotel. You may discover data on The President's Inn in Cape May, New Jersey, in a database for hotel reservation transactions created in Microsoft Access in Minilab. Ten of the Inn's rooms feature views of side streets, ten of the hotel's bay windows have a partial ocean view, and the other ten rooms are located in the front of the building. The number of visitors per room, duration of stay, and room type all affect how much a room costs. From one to four people share the same room rate. The fifth and sixth visitors must pay an extra $20 per person per day. The daily lodging charge is reduced by 10% for those staying for seven days or longer[1]–[3].

Currently, the proprietors employ a manual reservation and accounting system, which has led to several issues. Use the information to create reports on the most profitable client base, base revenue per room, and average length of stay. After responding to these inquiries, prepare a succinct report outlining the Inn's present financial status and making recommendations for the future. Making Better Decisions: Constructing and Pricing an Automobile Using Web Tools Software expertise: web-based applications Business knowledge: investigating product details and costs In this activity, you will utilize software at automobile Web sites to locate product details about a vehicle of your choosing and use that knowledge to make a significant buying decision. You will also assess two of these websites' effectiveness as sales tools.

You're thinking about buying a brand-new Ford Escape. Visit the Cars Direct website to get started with your research. FIND THE FORD EXCEL. Choose an Escape model based on its pricing, features, and safety ratings after researching the different models. Find at least two reviews and read them. Visit the manufacturer's website; in this example, Ford's. Compare the

Ford Escape information on Cars Direct with that on the Ford website. Try to find the automobile you desire at the lowest price in the stock of a nearby dealer.

Ethical Challenges in Technology Use for the Aging Community

The Australian government is very interested in using IT to provide both direct and indirect care for the elderly population. The administrative aspects of elder care in nursing and assisted living institutions are considered indirect care. IT undoubtedly has the ability to enhance the standard of living for seniors. For instance, having access to the Internet helps the elderly feel more connected to the rest of the world and, in many situations, may help them with day-to-day tasks like shopping for groceries, paying bills, and checking bank accounts online. This, however, is dependent on a number of variables, including their comfort level with computers, their level of computer knowledge and expertise, and, of course, and their level of confidence in online transactions. In an attempt to better treat chronic diseases including heart problems and diabetes, new concepts are being created via research and development. The employment of these technologies in particular raises several ethical concerns for healthcare practitioners and patients. The 'Smart House' is a Sydney effort that aims to let future generations age in place in their own houses. Numerous 'telecare' sensor technologies are used.

The technology also includes emergency pendants and pull cords to activate an emergency monitoring system, bed and chair sensors, passive infrared detectors, and a door-entry system that will enable the resident to see who is at the door, via their TV, and remotely open the door. Central locking systems, electronic windows and doors, electric curtain and blind openers, and other technologies will be included into the Smart House in the future. Privacy invasion of senior customers by such technologies is a recurrent moral dilemma. Even while they may see the advantages of such systems, many people may not feel comfortable being watched in their own homes, 24 hours a day. The knowledge, permission, ownership, and access to any data gathered from these elderly consumers are additional issues.

Health-related information is extremely sensitive and shouldn't be made available to the public without first taking privacy, security, and safety concerns into account. These technologies may not be accepted socially and culturally as a substitute for traditional human caregivers who can provide considerably more individualized care. Numerous aged care providers in Australia concentrate on various minority groups, and there is growing understanding that the technology used for them has to be socially and culturally competent, with the ability to adapt to these minority groups' social and cultural demands.

The first scenario demonstrates many moral concerns unique to providing healthcare for an aging population. Some of them, meanwhile, are persistent problems in other healthcare industries or in organizations in general. For instance, the information gathered via consumer monitoring and tracking might be advantageous from a commercial perspective, but it also presents chances for ethical misuse by compromising customers' privacy. These moral conundrums occur with the development of new information technologies that may promise improved productivity and effectiveness in commercial operations. In this, we want to emphasize the need of being aware of both the good and bad effects of information systems. Prior to the installation of a system, management often has to establish acceptable norms and standards that have the support of all stakeholders. Robert Mandelson from the University of Roehampton submitted the following section of the case. The introductory graphic emphasizes important issues brought up by this case and this. The 'Smart House' project in Sydney illustrates some of the potential for sensor-driven 'telecare' technology in both its indirect, administrative, and direct, in-home IT versions. The present technology's shortcomings were felt by administrators and users alike in the form of administrative load brought on by

incompatible systems and, in both instances, a lack of IT expertise. Further development of health care technologies is necessary to boost the efficiency of "telecare" technology delivery while also raising the quality of care provided to consumers at home. However, it has become clearer and clearer that significant ethical considerations need to be made in order to address the concerns of consumers, particularly in relation to privacy, security, safety, and increasingly cultural aspects, as sensor technology, and information systems that use the data from these, evolve and become more integrated using the Internet and the developments in cloud computing.

The conventional method of providing care for the elderly population within the health-care system has been to provide people with more assistance via the employment of health care specialists in specialized facilities. Sydney's "telecare" initiative is an example of how technology can support elderly people in their own homes for longer than has been possible thus far, enabling an improvement in the quality of care provided by health care providers and a decrease in the administrative burden. While this practice is anticipated to continue for the foreseeable future. Major ethical and social problems must be resolved when "telecare" technologies are created and employed more often in order to allay the fears of the elderly community members who will be provided these technologies in order to live normally at home. The Sydney 'Smart House' 'telecare' initiative has identified a number of processes that should be incorporated in future information system developments to address the ethical issues, including user involvement in the design of the information systems to incorporate features with the ethical concerns in-mind, redesign business processes which take into account the ethical concerns, allocate sufficient resources to include in the design the ethics informed features, and develop ethically sound information systems. Here are some issues to consider: What 'Smart Home' and 'telecare' technologies were used as part of the Sydney effort, and how were they utilized to serve the elderly population at home? How were the ethical issues raised by each 'telecare' technology being addressed?

DISCUSSION

A Model For Thinking About Ethical, Social, And Political Issues

Political, social, and ethical concerns are interconnected. The ethical conundrum an information system management could have is often mirrored in social and political discourse. An approach to contemplate these connections. Imagine society as a fragile ecology that exists in a state of partial equilibrium with people and with social and political institutions, like a relatively still pond on a summer day. People are aware of how to behave in this pond because social institutions have established well-honed standards of conduct, and these rules are reinforced by political laws that specify acceptable behavior and threaten penalties for non-compliance. Now throw a pebble into the pond's middle. What transpires? Well, there are ripples.

Instead, see the unsettling force as a strong shock of new information technology and processes striking a society that is mostly at peace. Individual players are suddenly faced with novel circumstances, which are often not covered by the previous laws. It may take years to build manners, expectations, social responsibilities, politically acceptable views, or accepted standards. Social institutions cannot react to these waves instantly. Political institutions often need to see evidence of actual damage before acting, and they also need time before creating new laws. You may need to do anything in the meantime. You could have no choice except to behave illegally.

This model may be used to show how social, political, and ethical concerns interact. The primary moral characteristics of the information society, which span the individual, societal, and political spheres of activity, may also be identified using this paradigm.

The Information Age's Five Moral Dimensions

The following moral aspects are among the main ethical, social, and political challenges brought up by information systems: New information technology is bringing forth a wave of new ethical, social, and political challenges that need to be addressed on a personal, societal, and political level. Information rights and responsibilities, property rights and obligations, system quality, life quality, and responsibility and control are the five moral aspects of these concerns.

Important Technology Trends That Present Ethical Concerns

Information technology came long before ethical concerns. However, information technology has increased ethical problems, stressed current social structures, and rendered certain laws either completely or significantly ineffective. These ethical strains are caused by four major technology developments. The majority of firms are now able to employ information systems for their primary production processes because to the doubling of computer power every 18 months. As a consequence, we now rely more on computers and are more susceptible to computer malfunctions and bad data. The laws and social norms have not yet changed to reflect this reliance. Information system accuracy and dependability standards are not always maintained or recognized by all parties.

The increasing number of databases on individuals—employees, customers, and future consumers—maintained by commercial and public institutions is the result of improvements in data storage methods and fast falling storage prices. These developments in data storage have made routinely violating people's privacy cheap and efficient. big businesses can afford to utilize very big data storage systems for customer identification that can handle terabytes of data. Another technical development that raises ethical questions is the development of data analysis methods for enormous data sets, which allows businesses and governmental organizations to learn very specific personal information about people. Companies may now much more simply bring together and integrate the many bits of information about you that are saved on computers thanks to modern data management systems.

Consider all the ways you collect information about yourself on computers, including credit card purchases, phone conversations, magazine subscriptions, video rentals, mail-order sales, banking transactions, records from the local, state, and federal governments, and website visits. If combined and mined effectively, this data might be used to determine not just your credit score but also your political preferences, relationships, reading and viewing preferences, driving patterns, and taste. To assist them more precisely target their marketing efforts, businesses having things to offer obtain pertinent information from various sources. S. 5 and S. 10 explain how businesses may quickly recognize client purchasing habits and offer individualized actions by analyzing big pools of data from many sources. Profiling is the process of using computers to compile information from many sources and produce electronic files with in-depth details on specific people. For instance, many of the most well-known websites use DoubleClick, an Internet advertising broker, to monitor the actions of its visitors in return for money from adverts based on the visitor data DoubleClick collects. Using this data, DoubleClick builds a profile of each internet user, filling in additional specifics whenever the user enters a DoubleClick site that is connected to that profile. In order to help businesses more effectively target their Web advertising, DoubleClick may amass a comprehensive dossier about a person's online spending and computing habits that is sold to them over time. Choice

Point compiles and maintains computerized dossiers on almost every adult in the US using information from police, criminal, and motor vehicle records, credit and work histories, current and former residences, professional licenses, and insurance claims. The firm sells this private information to companies and authorities. The need for personal data is so great that companies like Choice Point that act as data brokers are thriving. In order to generate customer profiles that might be sold to advertising companies, the two main credit card networks, Visa Inc. and MasterCard Inc., planned to combine credit card transaction information with consumer social network and other information in 2011. MasterCard will handle more than 23 billion transactions in 2012, while Visa will handle over 45 billion. These transactional details are not yet connected to online customer behavior. Nonobvious connection awareness, a novel data analysis tool, has provided the public and commercial sectors even more potent profiling capabilities. In order to detect criminals or terrorists, NORA may combine data on individuals from a variety of unrelated sources, including job applications, phone records, customer listings, and "wanted" lists, to correlate linkages and uncover hidden connections.

In order to, for instance, instantaneously identify a guy at an airline ticket counter who shares a phone number with a known terrorist before that person boards an aircraft, NORA technology scans data and extracts information as the data are created. Although the technology is seen as an important tool for homeland security, since it can provide such an in-depth account of a single person's relationships and actions, privacy concerns sometimes arise.

The NORA technology may use data about individuals from many sources to uncover complicated, unexpected associations. For instance, it may notify the hiring manager if it learns that a casino job applicant's phone number is shared with a known felon. Finally, improvements in networking, such as the Internet, promise to significantly lower the costs of transferring and accessing large amounts of data. They also make it possible to remotely mine large data sets using desktop computers, allowing for a degree of privacy invasion that was previously unthinkable.

Ethics in A Technological Society

Humans with free will are concerned about ethics. Ethics is about personal decision-making: What is the right moral decision when given a choice between two actions? What are the key components of an ethical decision?

Responsibility, accountability, and liability are fundamental ideas.

Individuals who are accountable for the results of their actions make ethical judgments. Responsibility is a crucial component of moral behavior. By taking responsibility, you acknowledge that the choices you make may have costs, responsibilities, and obligations. Systems and social institutions that are accountable have procedures in place to assess who acted responsibly and who is accountable. Ethics analysis and ethical action are essentially difficult in systems and organizations where it is impossible to determine who did what. Liability expands the idea of responsibility into the realm of legal obligations. Political systems with a corpus of laws allowing people to sue other people, institutions, or organizations for harm they have suffered have a trait known as liability. Due process, which is a characteristic of law-governed societies, is a procedure in which laws are recognized and understood and in which there is a possibility of making an appeal to guarantee that the rules are implemented properly. These fundamental ideas serve as the foundation for an ethical investigation of information systems and the people who oversee them. First, social institutions, groups, and people are used to filter information technology. Impacts are not produced by systems on their own. Whatever effects there are on information systems are a result of institutional, organizational, and human behaviors and actions. Second, the institutions, organizations, and

particular managers who decide to adopt the technology have full responsibility for the results. You can and will be held accountable for your activities if you use information technology in a socially responsible way. Third, via a system of rules defined by due process, people and other parties may seek compensation for harm done to them. This is possible in an ethical, political community.

Ethical Examination

How should you evaluate a scenario when it appears to bring ethical dilemmas? The following five-step procedure ought to be useful:

1. Clearly identify and state the facts. Find out who, where, when, and how they did what to whom. You will often be shocked by the inaccuracies in the first given data, and you will frequently discover that just clarifying the facts aids in defining the answer. Getting the opposing parties in an ethical problem to agree on the facts also helps.

2. Specify the issue at hand and point out the higher-order values at stake. Political, social, and ethical challenges constantly make reference to higher ideals. All disputing sides assert that they are seeking to uphold higher ideals. An ethical problem often includes two polar opposite routes of behavior that uphold honorable beliefs. For instance, the case study at the conclusion shows how two opposing values—the need for better health care record keeping and the need to preserve personal privacy—can coexist.

3. List the parties involved. There are participants in the game who have an interest in the result, who have invested in the scenario, and who typically have outspoken views for every ethical, social, and political problem. Learn who these organizations are and what they want. When creating a solution later on, this will be helpful.

4. List the choices you can make that are reasonable. It's possible that no alternative will fulfill every desire, but that some choices perform better than others. Finding an ethical or decent answer isn't necessarily about weighing the effects on many stakeholders.

5. Determine any possible repercussions of your choices. Although they may be morally sound, certain decisions might be terrible from other perspectives. Other approaches could be effective in one situation but fail in other, comparable situations. Always consider "What if I consistently choose this option over time?" [4]–[6].

Candidate's code of ethics

What moral guidelines or regulations need to you use once you've finished your investigation before making a choice? What higher-order values need to guide your decision-making? Although only you may choose which of the many ethical principles you will uphold and how you will order them, it is useful to take into account several ethical standards that have strong roots in many cultures and have persisted throughout recorded history:

1. Treat people like you would want to be treated. You may think about fairness in decision-making by putting yourself in the shoes of others and considering yourself the target of the choice.

2. If a course of action is not appropriate for someone to follow, it is not appropriate for everyone. Consider the question: "Would the organization or society survive if everyone did this?"

3. It is improper to perform any action at all if it cannot be repeated. The slippery-slope rule is as follows: An activity may result in a momentary, acceptable alteration, but if it is

continued over time, it will eventually result in unacceptable modifications. You may say that in everyday language by saying "once started down a slippery path, you may not be able to stop."

4. Take the activity that results in more or better value. This rule presupposes that you can rank order values and comprehend the effects of different actions.

5. Choose the course of action that poses the least risk of injury or expense. There are certain acts that have very high failure costs with either a very low risk of failure or a moderate probability of failure. Avoid these acts with a high failure cost and focus more on those with a moderate to high risk of failure [7]–[10].

6. Unless otherwise stated, assume that almost all physical and intangible items are the property of someone else. It has value if anything that someone else developed is valuable to you, and you should presume that the author seeks payment for their efforts.

Actions that do not readily comply with these guidelines need critical scrutiny and extreme caution. Even the impression of unethical activity may hurt you and your business just as much as engaging in unethical behavior.

CONCLUSION

In conclusion, utilizing a database to define corporate strategy improves organizational decision-making processes. Organizations may get insightful information that helps them make strategic choices by gathering, organizing, and evaluating pertinent data. A database serves as the basis for data-driven decision-making and facilitates cross-functional analysis, performance monitoring, and scenario planning. Effective database use helps businesses make better strategic decisions, adjust to changing market conditions, and prosper over the long haul. However, it takes considerable preparation and attention to develop and use a database for making strategic decisions.

To keep the database reliable, organizations must assure data quality, integrity, and security. To guarantee that data is accurate, accessible, and used appropriately, adequate data governance and data management processes are required.

REFERENCES

[1] F. Légaré, H. Robitaille, C. Gane, J. Hébert, M. Labrecque, and F. Rousseau, “Improving decision making about genetic testing in the clinic: An overview of effective knowledge translation interventions,” *PLoS One*, 2016, doi: 10.1371/journal.pone.0150123.

[2] D. S. M. Berisha- Namani and M. S. A. Qehaja, “Improving Decision Making with Information Systems Technology – A theoretical approach,” *Ilir. Int. Rev.*, 2013, doi: 10.21113/iir.v3i1.96.

[3] T. J. Chermack, “Improving decision-making with scenario planning,” *Futures*, 2004, doi: 10.1016/S0016-3287(03)00156-3.

[4] T. M. Amaral and A. P. C. Costa, “Improving decision-making and management of hospital resources: An application of the Promethee II method in an Emergency Department,” *Oper. Res. Heal. Care*, 2014, doi: 10.1016/j.orhc.2013.10.002.

[5] I. Pashar and L. Dwiantoro, “Pengaruh Empowerment Terhadap Pengambilan Keputusan Perawat: Kajian Literature Review,” *J. Holist. Nurs. Sci.*, 2020, doi: 10.31603/nursing.v7i2.3097.

[6] V. Campbell-Árvai, D. Bessette, L. Kenney, and J. Árvai, "Improving decision making for carbon management initiatives," *Int. J. Risk Assess. Manag.*, 2019, doi: 10.1504/IJRAM.2019.103338.

[7] D. Kellon and J. Arvai, "Five propositions for improving decision making about the environment in developing communities: Insights from the decision sciences," *Journal of Environmental Management*. 2011. doi: 10.1016/j.jenvman.2010.10.010.

[8] S. Geertshuis, "Improving decision making for sustainability: A case study from New Zealand," *Int. J. Sustain. High. Educ.*, 2009, doi: 10.1108/14676370910990729.

[9] I. Gorzeń-Mitka and M. Okręglicka, "Improving Decision Making in Complexity Environment," *Procedia Econ. Financ.*, 2014, doi: 10.1016/s2212-5671(14)00819-3.

[10] A. Fisher *et al.*, "Improving treatment decision-making in bipolar II disorder: A phase II randomised controlled trial of an online patient decision-aid," *BMC Psychiatry*, 2020, doi: 10.1186/s12888-020-02845-0.

CHAPTER 12

EXPLORING THE ROLE OF INTERNET IN MANAGEMENT OF INFORMATION

Dr. Nishant Labhane
Assistant Professor, Master in Business Administration (General Management),
Presidency University, Bangalore, India.
Email Id: nishantbhimrao@presidencyuniversity.in

ABSTRACT:

The rapid advancement of the internet and digital technologies has brought numerous benefits and opportunities to individuals and organizations. However, it has also posted significant challenges to privacy. This abstract explores the challenges that the internet presents to privacy and highlights the implications for individuals and society. The internet has transformed the way we communicate, access information, and engage in online activities. While it offers convenience and connectivity, it also collects vast amounts of personal data. Online platforms, social media, and e-commerce websites often collect and analyze user data to provide personalized services and targeted advertising. This practice raises concerns about the privacy of individuals and the potential misuse or unauthorized access to personal information.

KEYWORDS:

Behavioral Tracking, Big Data, Cybersecurity Breaches, Data Breaches, Data Mining, Digital Surveillance.

INTRODUCTION

Information technologies have spawned fresh moral conundrums that put one set of interests against another. For instance, a huge number of American telephone firms are using information technology to scale down on their workforces. By allowing computers to understand a customer's replies to a sequence of automated inquiries, voice recognition software decreases the need for human operators. Many businesses keep an eye on what their staff members are doing online to stop them from squandering time on non-work-related activities. Facebook keeps track of its users and then sells that data to app makers and advertising.

Each time, opposing values are at play, with groups positioned on either side of the issue. For instance, a firm may claim that it has the right to utilize information technologies to boost efficiency and cut down on staff in order to control expenses and maintain profitability. Employees who are laid off as a result of information systems may claim that employers are partially responsible for their wellbeing.

To prevent productivity losses, business owners may feel forced to keep an eye on employee e-mail and Internet use. Employees might feel that they should be able to utilize the Internet instead of the phone for quick personal chores. Sometimes a detailed examination of the facts might lead to compromises that offer each side "half a loaf." Consider putting some of the given ethical analysis guidelines into practice in each of these situations. What is the correct course of action in this part, we examine the five moral aspects of information systems in more detail. We define the ethical, social, and political levels of analysis in each dimension and utilize examples from the actual world to show the values involved, the stakeholders, and the solutions selected [1]–[3].

Information Rights: Freedom and Privacy in The Age of The Internet

Individuals' right to privacy is their demand to be left alone, unwatched, and free from intrusion from other people or groups, including the government. The workplace also involves privacy claims: Numerous high-tech surveillance methods, including electronic ones, are used to monitor millions of workers. Individual privacy rights are at danger because information technology and networks make privacy invasions easy, affordable, and efficient. The right to privacy is guaranteed in various ways by the constitutions of the United States, Canada, and Germany, as well as by numerous regulations in other nations. The First Amendment's provisions of freedom of expression and association, the Fourth Amendment's prohibitions against arbitrary searches and seizures of one's person or property, and the guarantee of due process all serve to safeguard one's right to privacy in the United States.

The majority of privacy laws in the United States and Europe are based on a system known as Fair Information Practices, which was initially outlined in a report by a federal government advisory group in 1973 and most recently modified in 2010 to account for new privacy-invading technologies. FIP is a set of guidelines that control how personal data is gathered and used. The idea of a mutuality of interest between the record holder and the person is the foundation of FIP principles. The record keeper typically a company or government agency needs information on the individual to facilitate the transaction since the individual is interested in participating in it. Once information has been collected, the person retains ownership of the record, and it cannot be used to further any other purposes without the subject's permission. The original FIP was revised and expanded by the FTC in 1998 to include recommendations for safeguarding online privacy.

Changes in privacy law are being influenced by the FTC's FIP principles. The Children's Online Privacy Protection Act was approved by the U.S. Congress in July 1998, and it mandates that Web sites acquire parental consent before collecting information about children under the age of 13 in any way. The FTC has advocated for new laws to safeguard online consumer privacy in ad networks that gather data on consumer Web behavior to create comprehensive profiles that are then used by other businesses to target online advertisements. Three practices were introduced by the FTC to its privacy framework in 2010. Companies should implement "privacy by design," creating goods and services that safeguard privacy. Businesses should make their data practices more transparent. Additionally, businesses should get consumer permission and provide customers a clear way to reject data collecting plans. The protection of personal information collected online that relates to people not covered by COPPA, the protection of personal information collected online that deals with individuals, and the restriction of data mining for homeland security are the main objectives of other proposed Internet privacy legislation.

The FTC expanded its FIP doctrine to address the problem of behavioral targeting starting in 2009 and continuing through 2012. The FTC convened hearings to go over its voluntary industry standards program for controlling behavioral targeting. The Network Advertising Initiative, a trade association for internet advertising, released its own self-regulatory standards, which broadly echoed those of the FTC. However, there are still disagreements between the government, privacy advocates, and the internet advertising sector on two concerns. Advocates for privacy seek both a nationwide Do Not Track list and an opt-in policy for all websites. The business community objects to these changes and insists that the only way to stop monitoring is to have an opt-out option. Hearings on consumer privacy issues and the potential role of the federal government in defending consumers in the mobile market were held in May 2011 by Senator Jay D. Rockefeller, Chairman of the Senate Commerce Subcommittee on Consumer Protection, Product Safety, and Insurance. Rockefeller is in favor of the Do-Not-Track Online

Act of 2011, which mandates that businesses inform customers when they are being monitored and gives them the option to refuse such monitoring. However, there is a growing understanding among all stakeholders that more user control and openness are necessary to cope with behavioral monitoring.

Recent legislation deregulating financial services and guaranteeing the preservation and transfer of personal health information now include privacy rights as well. Consumers of financial services have certain privacy protections under the Gramm-Leach-Bliley Act of 1999, which repeals prior limits on connections between banks, securities firms, and insurance businesses. Financial institutions must enable clients to opt out of information-sharing agreements with unaffiliated third parties and explain their policies and procedures for safeguarding the privacy of nonpublic personal information. Medical record privacy is protected under the Health Insurance Portability and Accountability Act of 1996, which went into effect on April 14, 2003. The legislation grants people access to their personal medical records kept by hospitals, health insurers, and healthcare providers as well as the power to consent to the use or disclosure of their protected health information. Doctors, hospitals, and other healthcare professionals are only permitted to disclose patient personal information to the extent required to fulfill a specific purpose.

The European Data Protection Directive

In comparison to the US, privacy protections are substantially stricter in Europe. European nations, in contrast to the United States, prohibit companies from using personally identifiable information without the clients' permission. The European Commission's Data Protection Directive entered into force on October 25, 1998, enhancing privacy protection throughout the member states of the European Union. According to the rule, businesses must notify customers when they acquire personal information about them and explain how it will be maintained and utilized. Customers have the right to examine their data, have it corrected, and request that no further data be collected before any firm may lawfully use the information about them. Consent that has been granted with full awareness of the information required to make an informed choice is known as informed consent. Member states of the EU are required to incorporate these principles into their national legislation and are not permitted to transmit personal data to nations like the United States that do not have comparable privacy protection laws. New regulations restricting the use of third-party cookies for behavioral tracking were adopted by the European Parliament in 2009. These new regulations, which went into effect in May 2011, demand that users of websites explicitly agree to being followed by cookies. If third-party cookies are being utilized, websites must provide clear warnings on their pages.

The European Union announced substantial proposed updates to its data protection laws in January 2012, the first revision since 1995. The new regulations, which would be applicable to all businesses offering services in Europe, would call for the collection of explicit consent from customers before using their personal data, the deletion of information at the user's request, and the retention of data for no longer than is absolutely necessary. The proposed regulations call for penalty of up to 2% of the violating businesses' yearly gross income. With an annual revenue of $38 billion, Google would be subject to a maximum penalties of $760 million. The use of cookies and super cookies for tracking purposes throughout the Web is subject to the need for user permission; however, this rule does not apply to cookies used on specific websites. Similar to the FTC's proposed framework, the EU's new proposed regulations place a major focus on restricting data retention periods, controlling monitoring, and gaining user permission [4]–[6].

The U.S. Department of Commerce designed a safe harbor framework for American businesses in collaboration with the European Commission. A safe harbor is a private, self-policing policy

and enforcement system that satisfies the requirements of governmental regulations and laws but excludes the use of governmental regulation or enforcement. If U.S. companies create privacy protection procedures that adhere to EU regulations, they will be permitted to utilize personal data from EU nations. Self-policing, regulation, and government enforcement of fair trade laws would be used for enforcement in the United States.

DISCUSSION

The preservation of personal privacy now faces additional difficulties as a result of internet technology. Before reaching its intended destination, information delivered across this enormous network of networks may transit via a number of different computer systems. These systems are all capable of keeping an eye on, recording, and storing communications that travel through them. Websites keep track of a person's online activity, including their searches, the websites and pages they visit, the online material they access, and the products they browse or buy. Without the visitors' awareness, this background monitoring and tracking of Web site users takes place. Advertising networks like Microsoft Advertising, Yahoo, and DoubleClick, which have the ability to trace individual browser activity across hundreds of websites, also engage in it. Publishers of websites and the advertising sector both support tracking people around the Internet since it enables more relevant adverts to be shown to consumers and helps to defray the cost of running websites. This is similar to broadcast television in that it offers user-supported material that is free. This personal data is in high demand from the business world.

When a user visits a website, a little text file called a cookie is placed on their computer's hard drive. Cookies monitor website visits and recognize the visitor's web browser. The Web site program will search the visitor's machine, discover the cookie, and know what the visitor has previously done when they visit a site that has saved a cookie. Depending on the action during the visit, it may additionally refresh the cookie. The website may then tailor its content to each visitor's preferences. For instance, if you buy a book on Amazon.com and come back later using the same browser, the website will greet you by name and suggest further books based on your prior purchases. Cookies are used by DoubleClick, which was previously discussed in this article, to compile dossiers containing information about online transactions and track visitors to websites.

The identities and addresses of visitors cannot be directly obtained by websites utilizing cookie technology. The information may be used in conjunction with cookie data to identify a visitor, however, if they have registered with the website. In order to create extremely specific profiles of its users, website owners may also combine the information they have received through cookies and other Web site monitoring techniques with personal information from other sources, such as offline information gained from surveys or print catalog sales. Even more sophisticated and covert methods are now available for monitoring Internet users. Every time a person clicks on a Flash video, so-called "super cookies" or Flash cookies may be placed; they are difficult to remove. Flash places these so-called "Local Shared Object" files on the user's computer without their permission and uses them to play movies. Web beacons are an additional tool used by marketers to track online activity.

Web beacons, also known as Web bugs, are small software applications that track users' online clickstreams and transmit this information to the owner of the tracking file when they are covertly embedded in e-mails and Web pages. They are used to track users' online activity when they visit Web sites and send emails. Third-party businesses who pay the famous websites for access to their audience display web ads there. How widespread is Web tracking then? Researchers looked into the monitoring files on 50 of the most popular US websites in a ground-breaking series of stories published in the Wall Street Journal in 2010 and 2011. They

discovered a pretty extensive surveillance apparatus. 3,180 tracking files were placed on visitor PCs at the 50 sites. Wikipedia was the only website without any tracking files.

Few well-known websites, including Dictionary. More than 100 tracking files were deployed by com, MSN, and Comcast! The majority of the tracking files 2/3 of them came from 131 businesses whose main activity is to identify and monitor Internet users in order to develop consumer profiles that can be sold to ad agencies searching for certain kinds of clients. Google, Microsoft, and Quant cast were the three largest trackers; they are all in the business of selling advertisements to advertising agencies and marketers. A follow-up research conducted in 2012 revealed that things had become worse: tracking on the top 50 websites had increased by almost five times! The reason for this is the expansion of online ad auctions, where marketers may purchase information on how individuals browse the Web.

By piggybacking on more substantial apps, other malware may covertly install itself on a computer used for browsing the Internet. Once installed, the spyware may report the user's online activities to other computers and asks Web sites to deliver banner adverts and other unwanted content to the user. Google is the world's biggest data collector of online user information, with Google Search and other Google services being used by almost 75% of Internet users worldwide. The use of Google's data has a significant influence on internet privacy. According to the majority of experts, Google has access to more personal data on more individuals than any other government body. The closest rival is Facebook.

Google has been employing behavioral targeting since it bought the advertising network DoubleClick in 2007 to display more relevant advertisements based on users' search activity and to target people as they travel from one website to another in order to offer them display or banner adverts. Google permits tracking software on its search results pages, and it can monitor visitors all across the Internet by utilizing DoubleClick. One of its initiatives lets marketers target advertising based on users' search history as well as any other data they may have provided to Google, such as their age, geography, and other online activity. With the use of its AdSense program, Google may assist advertisers in choosing keywords and creating advertising for different market groups based on search histories, such as assisting a clothes website in developing and testing ads for adolescent girls. According to a recent survey, 88% of 400,000 websites had at least one Google tracking flaw.

The contents of emails that Gmail users receive are also being scanned by Google. Gmail is a free web-based email service. Users who read their email may see advertisements that are relevant to the messages' topics. Based on the information in each user's email, profiles are created for them. Google now offers out tailored banner advertisements via its DoubleClick ad network in addition to displaying targeted ads on YouTube and Google mobile apps. Without getting the informed agreement of the person whose information is being used, the United States has permitted firms to collect transaction information created in the marketplace and use that information for additional marketing purposes. Until a customer expressly asks that their data not be collected, an opt-out informed consent model allows the acquisition of personal information. The adoption of an opt-in model of informed consent, in which a company is forbidden from collecting any personal information unless the customer directly approves information collection and usage, is something privacy advocates would want to see more of. The default setting in this case is to not collect any user data [7]–[10].

In order to safeguard customers, the internet sector has chosen self-regulation over privacy laws. The internet Privacy Alliance was established by the internet advertising sector to promote self-regulation and provide a set of privacy guidelines for its members. The organization encourages the use of online certifications that guarantee websites adhere to

certain privacy rules, such as the Trustee seal. In order to create its own privacy policies, the Network Advertising Initiative was founded by members of the advertising network industry, including Google's DoubleClick. These policies will assist consumers in opting out of advertising network programs and will offer consumers recourse in cases of abuse.

To address public concerns about internet monitoring, private companies including Microsoft, Mozilla Foundation, Yahoo, and Google have created their own rules. In 2012, Microsoft has committed to shipping its brand-new Internet Explorer 10 Web browser by default with the opt-out option enabled. Users of AOL's website may opt out of being monitored according to the company's opt-out policy. Yahoo complies with NAI standards and offers an opt-out feature for tracking and Web beacons. Google has shortened its tracking data retention period. In general, consumers don't take the necessary precautions to preserve their privacy, and the majority of Internet firms do nothing to secure the privacy of their clients. The majority of money for commercial websites that rely on advertising comes from selling user information. About half of the businesses who do have privacy rules on their websites don't keep an eye on them to make sure they're being followed. Less than half of online shoppers who profess to be worried about internet privacy actually read the privacy policies on websites. Most privacy rules on websites are vague concerning essential phrases and need a legal degree to comprehend.

A group of Berkeley undergraduates performed surveys of internet users and of privacy-related FTC complaints in one of the most perceptive examinations of consumer views regarding Internet privacy. Some of their findings are as follows: individuals believe they have little control over the data gathered on them, and they are unsure of whom to complain to. Websites gather all of this information but deny users access, have ambiguous rules, and share it with "affiliates" without ever disclosing who they are or how many there are. Web bug trackers are commonplace, and consumers are not told of them when they visit certain sites. Consumers are not saying, "Take my privacy, I don't care, send me the service for free," according to the findings of this study and others; rather, they are saying, "We want access to the information, we want some controls on what can be collected, what is done with the information, the ability to opt out of the entire tracking enterprise, and some clarity on what the policies really are. We don't want those policies changed without our participation and permission."

Practical Options

A few technologies can safeguard user privacy when they interact with websites, in addition to laws. Many of these programs are used to encrypt email, mask browsing and email activity, stop client computers from accepting cookies, and detect and remove malware, among other things. Technical solutions have often failed to shield consumers from tracking when they switch between websites. The focus has switched to browsers as a result of mounting public criticism of behavioral monitoring and ad targeting, as well as the inability of the industry to self-regulate. Do Not Track settings are available in several browsers. Users who have chosen the Do Not monitor browser setting will have their browser submit a request to websites asking them not to monitor their online activity. This opt-out option is supported by both Internet Explorer 9 and Mozilla's Firefox browser. However, these browsers come pre-configured with tracking enabled. The Options Privacy option in their browser is also seldom used by consumers. Microsoft's proposals have been fiercely resisted by the internet advertising sector, which also cautions that websites are not required to abide by users' Do Not Track requests. There is currently no regulation forcing websites to cease monitoring users, and the internet advertising industry has not agreed on how to handle Do Not Track requests. The Life on the Grid: iPhone Becomes track interactive session on technology explains how people may be tracked using their mobile phones.

Intellectual Property

Modern information technologies have posed serious legal and societal challenges to the protection of private intellectual property. Intangible property developed by individuals or businesses is referred to as intellectual property. Due to the ease with which computerized material may be transferred on networks or replicated, information technology has made it challenging to safeguard intellectual property. Trade secrets, copyright, and patent law are three legal traditions that provide various protections for intellectual property.

Commerce Secrets

As long as it is not based on publicly available information, any intellectual work product—a formula, gadget, pattern, or collection of data—used for commercial purposes may be categorized as a trade secret. Trade secret protections differ from state to state. Trade secret laws often confer a monopoly on the concepts that underlie a work product, but it may be a very flimsy monopoly. Software may be classified as a trade secret if it has innovative or distinctive components, processes, or compilations. The real ideas included in a work product are protected under trade secret legislation, not just how they are expressed. To make this claim, the inventor or owner must take care to enforce nondisclosure agreements on their workers and clients and to keep the secret from being known to the public. The drawback of trade secret protection is that, despite the fact that almost all software systems of any complexity have some distinctive components, it is challenging to keep the work's concepts from entering the public domain when the software is extensively used.

You seem to like your smartphone. Grid-based living has its benefits. With the same "communication and media device," you can access the Internet, go to your Facebook page, obtain Twitter feeds, view videos, and listen to music. On the grid entails almost constant monitoring of your whereabouts, surroundings, routines, and social circles. You could first look for and locate things on the Web, as well as certain pals. The mobile Web grid now keeps track of you and your pals in order to market goods and services to you.

Modern smartphone technology can pinpoint your location to within a few yards. Additionally, there is a lot of money to be earned if you know where you are. It is possible to track you throughout the day by using your smartphone for everyday activities, to submit this information to corporate databases, to save and analyze the information, and to sell it to advertising. Numerous businesses have evolved business strategies that depend on smartphones' capacity to report on your locations, whether or not you want to do so. The majority of well-known applications share your location. The locations of criminals and suspects are obviously of interest to law enforcement. Of course, there are a lot of occasions when you'd wish to automatically or manually report your whereabouts. For instance, if you were hurt, you could want your mobile phone to automatically send the position of where you are to the police, or if you were at a restaurant, you might want to let your friends know where you are and what you're doing. What about times when you don't want anybody, least of all marketers and advertising, to know where you are?

Because advertising businesses can send you highly tailored advertisements, discounts, and flash sales depending on where you are, location data collected from mobile phones has exceptional economic value. Numerous location-based applications, such as mobile maps and charts, shopping apps, and social media apps that let your friends know where you are and what you're up to, are built on this technology. According to Gartner, the market for location-based services would generate revenues of $3.8 billion by the end of 2012 and $10.3 billion by the end of 2015.

But who gathers, uses, and from whence does the location data come? The Wall Street Journal's investigation of smartphone tracking technologies and personal location information was released in April 2011. They found that for a number of reasons, both Google's Android and Apple's iPhone were gathering private, personal location data. Although Google currently leads in search across most platforms, Apple is also attempting to establish itself in the mobile advertising industry. Both companies are constructing enormous databases that can identify your position. For such information and for the distribution of their mobile adverts, advertising companies will pay Apple and Google.

Once every 12 hours, Apple sends your location information back to its servers, and it also keeps a record of your whereabouts on your iPhone. Android mobile devices regularly broadcast location information. On the iPhone gadget, Apple files may be kept for a long time. In addition to denying sharing this information with third parties and that it can be used to identify specific people, Apple and Google both assert that the information is only used to pinpoint the location of mobile devices for Wi-Fi-connected phones and to enhance the user experience of location-based services. The technology used by Apple measures the Wi-Fi signal strength of neighboring transmitters, pinpoints and records their locations, and then determines where the iPhone device is. As a consequence, there is a large database of Wi-Fi hotspots in the US and a way for finding iPhones that is not reliant on GPS signals. Both businesses assert that they must have the location data in order to enhance their offerings. Additionally, location monitoring is becoming more advanced. Newer tracking technologies can now automatically identify the locations you visit, track your arrival and departure times, keep track of how often you visit a certain site, and even determine if you were sitting, walking, or driving. This sort of next-generation monitoring technology is being developed by a number of businesses, including Aloha Mobile, Skyhook, WI farer, and Broadcom, and it will provide the information you create with your smartphone even more value.

Based on the GPS capabilities of the smartphone, location-based smartphone applications are additional sources of private, personal location data. With the help of the well-known mobile networking app Foursquare, users may automatically notify their Facebook friends and other users of their whereabouts when they "check in" at a restaurant or other place. When moving to a new town,

Your location is sent through the app, which also provides you popular nearby sites and user evaluations. Upon opening Foursquare on your smartphone, you will get a list of nearby pubs and eateries based on your device's GPS location. You can then choose a spot and "check in," which notifies your friends. There is a well-known loyalty program for Foursquare. Users get points and badges for each check-in, which they may subsequently redeem for discounts at other establishments. Based on how often they check in over the course of a month, visitors to sites fight to become the "Mayors" of the venue. Mayors are given exclusive discounts.

An increasing number of people are worried about the privacy of individual subscribers to location-based services like Foursquare and their connections on Facebook and Twitter who may not be users. Many observers worry that these services will run automatically, without the user's knowledge or consent. When it was discovered in 2011 that Apple and Google were covertly and persistently gathering individual, private, and geographical data, privacy organizations and Congress started looking into the matter. The majority of mobile phone users are unaware that law enforcement authorities may easily access their whereabouts and trips by sending a simple email request, without court scrutiny, and at the cost of the carriers. A U.S. citizen was killed in June 2012. The Supreme Court declared that law enforcement may not employ GPS devices installed on a vehicle to monitor suspects without a warrant, while a district judge in California determined that Apple must defend itself against a lawsuit accusing

it of surreptitiously collecting location data on millions of its iPhone and iPad user Wireless location-based services are still mainly unregulated as of right now. The Federal Communications Commission and the Federal Trade Commission hosted a meeting in 2011 to talk about the societal effect of location-based services, both good and bad, with business and privacy organizations. Industry spokesman for Facebook,

Because they depend on user rights to share location data, Google and Foursquare maintained that current applications and company procedures were sufficient to guarantee individual privacy. The business said that if customers didn't really profit from revealing their location information, they wouldn't do so freely. Privacy experts questioned whether users were aware that their location was being shared and what level of "informed consent" was gained. Privacy advocates cited the lack of a privacy policy in 22 of the top 30 paid apps, the fact that the majority of popular apps transmit location data to their developers rather than keeping it under tight control, and the fact that these services are leading to a situation in which governmental organizations, marketers, creditors, and telecommunications companies will have access to almost all information about citizens, including their whereabouts. Services that automatically and continuously locate individuals without giving consumers a chance to disconnect from the grid and without allowing them to turn off the location functions of their phones are the largest threat they highlighted.

Copyright

Copyright is a legal privilege that protects intellectual property creators from having their work duplicated for any reason for the duration of their lives and an extra 70 years after their deaths. For works held by corporations, copyright protection is in effect for 95 years after the date of creation. Books, magazines, lectures, plays, musical compositions, drawings, maps, photographs, motion pictures, and periodicals all now have copyright protection thanks to legislation passed by Congress. By guaranteeing that creative individuals obtain the financial and other advantages of their work, copyright rules aim to promote innovation and authorship. The majority of industrialized countries have their own laws governing copyright, and there are a number of international treaties and bilateral agreements that allow countries to cooperate and enforce their legal frameworks.

The Copyright Office started registering software programs in the middle of the 1960s, and in 1980 Congress passed the Computer Software Copyright Act, which outlines the buyer's rights to use the software while the creator retains legal title and clearly protects software program code and copies of the original sold in commerce. Copyright prohibits the whole or partial duplication of programs. For an infringement, damages and remedies are easily attainable. The disadvantage of copyright protection is that it only protects how those ideas present themselves in a work, not the ideas themselves. Without violating a copyright, a rival may use your program, figure out how it works, and create new software using the same principles.

Lawsuits alleging "look and feel" copyright infringement focus specifically on the difference between a concept and its manifestation. For instance, in the early 1990s, Apple Computer sued Hewlett-Packard and Microsoft Corporation for allegedly copying the expression of overlapping windows used in Apple's Macintosh interface. The defendants contended that the merger theory of copyright law did not apply since the concept of overlapping windows can only be articulated in a single fashion. The expression cannot be protected by copyright when ideas and their expression are combined. In general, it seems that courts are adopting the logic of the 1989 case Brown Bag program v. Symantec Corp., where the judge examined the components of the allegedly infringing program. According to the court, copyright law does not provide protection for identical concepts, functions, general functional aspects, or colors.

Patents

A patent gives the owner a 20-year exclusive monopoly on the concepts behind an invention. The purpose of the patent law, as intended by Congress, is to protect new machine, device, or method inventors from infringement and to enable widespread use of the invention by making clear diagrams available to those wishing to use the concept under license from the patent's owner. The United States Patent and Trademark Office uses court decisions to decide whether to award a patent. Originality, uniqueness, and invention are the three main ideas in patent law. Until a 1981 Supreme Court judgment that declared that computer programs may be a part of a patent procedure, the Patent Office did not typically accept applications for software patents. Since then, thousands more patents are under review in addition to the hundreds that have already been issued.

Because it gives a monopoly on the underlying concepts and ideas of software, patent protection is strong. Passing strict requirements for originality, inventiveness, and no obviousness while also having to wait years for protection is challenging. In 2011, Apple filed a lawsuit against Samsung for infringing on its patents for iPhones, iPads, and iPods in what some have dubbed the patent trial of the century. On August 24, 2012, a California jury in a federal district court handed Apple a resounding win and Samsung a shocking loss. Apple received a $1 billion damage judgment from the jury. The ruling established guidelines for figuring out how close a rival may get to an industry-leading and standard-setting device like Apple's iPhone without infringing on the leading company's design and utility patents. The same court decided that Samsung could not market its new t computer in America. Not only did Samsung lose, but Google, the company that created the Android operating system, as well as all other manufacturers of Android phones, including Google's recently acquired Motorola Mobility, received a warning shot.

CONCLUSION

In conclusion, Due to data gathering techniques, security risks, lack of control over personal information, and legislative complications, the internet creates serious privacy concerns. To overcome these obstacles, everyone must work together to preserve personal information, create transparent privacy laws, and promote a data stewardship culture. For individual liberty, faith in digital technology, and the general welfare of people and society, online privacy protection is crucial. Internet privacy issues must be addressed in a multifaceted manner including people, organizations, and politicians. People must be aware of their rights to online privacy, use safe web browsing techniques, and use care when disclosing personal information online. By establishing strong data protection mechanisms, receiving informed permission, and openly disclosing their privacy policies to consumers, organizations must emphasize user privacy. Policymakers must create comprehensive privacy frameworks and laws that strike a compromise between upholding private rights and fostering economic development.

REFERENCES

[1] R. H. Weber, “Internet of Things - New security and privacy challenges,” *Comput. Law Secur. Rev.*, 2010, doi: 10.1016/j.clsr.2009.11.008.

[2] J. H. Ziegeldorf, O. G. Morchon, and K. Wehrle, “Privacy in the internet of things: Threats and challenges,” *Secur. Commun. Networks*, 2014, doi: 10.1002/sec.795.

[3] R. Roman, J. Zhou, and J. Lopez, “On the features and challenges of security and privacy in distributed internet of things,” *Comput. Networks*, 2013, doi: 10.1016/j.comnet.2012.12.018.

[4] A. M. Hassan and A. I. Awad, "Urban Transition in the Era of the Internet of Things: Social Implications and Privacy Challenges," *IEEE Access*, 2018, doi: 10.1109/ACCESS.2018.2838339.

[5] S. Wachter, "Normative challenges of identification in the Internet of Things: Privacy, profiling, discrimination, and the GDPR," *Comput. Law Secur. Rev.*, 2018, doi: 10.1016/j.clsr.2018.02.002.

[6] K. Zaidi and M. Rajarajan, "Vehicular internet: Security & privacy challenges and opportunities," *Futur. Internet*, 2015, doi: 10.3390/fi7030257.

[7] M. S. Virat, S. M. Bindu, B. Aishwarya, B. N. Dhanush, and M. R. Kounte, "Security and Privacy Challenges in Internet of Things," in *Proceedings of the 2nd International Conference on Trends in Electronics and Informatics, ICOEI 2018*, 2018. doi: 10.1109/ICOEI.2018.8553919.

[8] J. H. Lee and H. Kim, "Security and Privacy Challenges in the Internet of Things [Security and Privacy Matters]," *IEEE Consum. Electron. Mag.*, 2017, doi: 10.1109/MCE.2017.2685019.

[9] C. P. Mayer, "Workshops der Wissenschaftlichen Konferenz Kommunikation in Verteilten Systemen 2009. Security and Privacy Challenges in the Internet of Things Security and Privacy Challenges in the Internet of Thing," *Electron. Commun. EASST*, 2009.

[10] T. A. Butt, R. Iqbal, K. Salah, M. Aloqaily, and Y. Jararweh, "Privacy Management in Social Internet of Vehicles: Review, Challenges and Blockchain Based Solutions," *IEEE Access*, 2019, doi: 10.1109/ACCESS.2019.2922236.

CHAPTER 13

EXPLORING THE INTELLECTUAL PROPERTY RIGHTS IN NEW INNOVATIONS

Ms. Swati Sharma
Assistant Professor, Masters in Business Administration,
Presidency University, Bangalore, India.
Email Id: swatisharma@presidencyuniversity.in

ABSTRACT:

Intellectual property rights (IPR) are crucial for fostering innovation, creativity, and economic growth. However, the digital age has brought forth numerous challenges to the protection and enforcement of intellectual property rights. This abstract explores the key challenges faced by intellectual property rights holders and highlights their implications for innovation, content creators, and society as a whole. The digital revolution has transformed the way information is created, accessed, and shared. With the advent of the internet and digital technologies, the unauthorized reproduction, distribution, and sharing of copyrighted materials have become prevalent. Online piracy, file-sharing platforms, and streaming services have made it easier for individuals to infringe upon intellectual property rights, undermining the economic viability of content creators and rights holders.

KEYWORDS:

Counterfeiting, Digital Piracy, Domain Name Disputes, Global Enforcement, Infringement, Licensing Agreements.

INTRODUCTION

Modern information technologies, particularly software, provide serious difficulties for current intellectual property systems and, as a result, raise important ethical, social, and political dilemmas. A software work may be difficult to define as a program, book, or even music. Digital media also vary from books, journals, and other media in that they are small, making theft simple, and it is difficult to establish originality. The spread of electronic networks, such as the Internet, has made intellectual property protection even more challenging. Before the widespread usage of networks, distribution was hampered by the need to keep copies of software, books, magazine articles, or films on physical medium such paper, computer disks, or videotape. Information may be disseminated and reproduced more broadly when using networks. According to the International Data Corporation and the Business Software Alliance's ninth annual study on global software piracy, the rate of software piracy increased to 42 percent in 2011 and cost the world $63 billion. In the whole world, for every $100 in legal software sales in that year, an extra $75 in criminal software purchases were made.

The Internet was created to enable the unrestricted global transmission of information, including that which is subject to copyright. You may simply duplicate and distribute nearly anything to hundreds or even millions of people worldwide with the help of the World Wide Web, even if they use various kinds of computers. Even if these parties do not voluntarily take part in the infringement, information may be illegally copied from one location and spread across other systems and networks [1]–[3]. Digital MP3 music files have been copied and distributed illegitimately online for a number of years. File-sharing services, like Napster, Grosser, Kazak, and Morpheus subsequently emerged to assist users in finding and exchanging

digital music files, even those with copyright protection. The prevalence of illegal file sharing reached a stage that it jeopardized the future of the music recording business and, at one time, used 20% of the Internet's capacity. Although the recording industry prevailed in the legal fights to shut down these sites, it has not been able to completely stop illicit file sharing.

Even if illicit file sharing hasn't stopped, it has decreased since the iTunes Store opened in 2001. Illegal file sharing has decreased as genuine online music retailers and, more recently, Internet radio services like Pandora, have grown. Technology has significantly changed the chances of protecting intellectual property against theft, at least in the case of music, videos, and television programs. A closed environment where music and movies could not be readily duplicated and widely circulated unless they were played on Apple devices was established by the Apple iTunes Store, which legitimized paying for music and entertainment. Due to the fact that its books cannot be transferred to the Internet and disseminated, Amazon's Kindle also safeguards the rights of publishers and authors. Hollywood movies and Internet radio are also streamed on platforms like Pandora and Spotify, which prevents piracy since the broadcasts can't be readily captured on other devices. Furthermore, since they rely on these assets to generate income, major Web distributors like Apple, Google, and Amazon do not wish to promote music or film piracy.

Additionally, limited copyright protection is offered under the Digital Millennium Copyright Act of 1998. The DMCA put into effect a World Intellectual Property Organization Treaty that makes it unlawful to go beyond the protected content's technologically based security measures. Once they are made aware of the issue, Internet service providers are obligated to remove the websites they are hosting that are owned by copyright violators. The Software and Information Industry Association, which advocates for new legislation and the enforcement of current laws to safeguard intellectual property throughout the globe, represents Microsoft and other significant software and information content companies. The SIIA provides instructional programs to assist firms battle software piracy, operates an anti-piracy hotline for people to report pirate activities, and has produced guidelines for employee software usage.

DISCUSSION

Accountability, Liability, And Control

New information technologies are testing current liability laws and societal norms for holding people and organizations accountable, together with privacy and property rules. Who should be held accountable and responsible if a person is hurt by a device that is partially controlled by software? Should users be kept blameless from any accountability for the content they transmit, or should public bulletin boards and electronic services like America Online allow the transmission of pornographic or objectionable material? How does the Internet fare? Can you hold an outside vendor accountable for harms caused to your clients if you outsource information processing? These queries could be clarified by some instances from the actual world.

Problems with Computer-Related Liability

The most important service offered by smartphone manufacturer Research in Motion was disrupted for a week in October 2011 for millions of BlackBerry customers worldwide. Users from Asia, Europe, the Middle East, and the Americas were among the 70 million BlackBerry users who experienced the three-day email outage. Due to its superior email security and seamless integration with corporate mail systems, the BlackBerry had the leading position in the business smartphone market until recently. More than half of all new corporate mobile devices are now iPhone and Android smartphones, which are supported by workers. More

businesses are anticipated to stop using the BlackBerry as a result of the outage. Positively, since drivers couldn't text or call using their BlackBerry during the outage, police agencies throughout the globe reported a dramatic decrease in urban traffic accidents. David Yacht, CTO for Software at Research in Motion, said that a backlog of mails to Europe caused a cascading outage that affected the whole globe after the outage.

There was no proof that a hack or security breach was responsible for the original European BlackBerry email service, according to the business, which identified the underlying problem. While RIM customers in Europe had been experiencing significant disruptions for days, it wasn't until the Americas got the virus that BlackBerry users began to voice their complaints on Twitter about mail delays and device access issues. Yacht attributed the first disruption to a core switch failure at RIM. The real issue, however, started when RIM's redundant systems also failed. "The failover did not function as expected," Yacht stated, "despite the fact that we regularly test failover systems." This resulted in a sizable backup of messages. that is responsible for any financial loss brought on by people or companies that were unable to access their e-mail for these three days? Is the mobile phone carrier responsible for damages if customers pay for a cell phone plan, depend on it, and then have a prolonged outage?

This instance highlights the challenges encountered by information systems executives, who are ultimately liable for any damage caused by the technologies they have chosen and built. Beyond IT administrators, the creator and operator of computer software may be held accountable for damages if the program is a component of a machine that causes someone bodily or financial harm.

Courts have been hesitant to hold writers, publishers, and booksellers accountable for contents because software works like a book, storing and presenting information; as a result, courts have been weary of holding software creators liable for software.

It is often highly challenging to hold software developers accountable for their products, which are seen as being similar to books, regardless of the physical or financial damage that follows. In the past, liability lawsuits against print publishers of books, magazines, and other printed materials have not been brought because of concerns that they may impede First Amendment rights to freedom of speech.

Why not consider software as a service? Customers of banks are given access to ATMs as a service. Customers may experience annoyance and even suffer financial loss if they are unable to access their cash in a timely way should this service fail. Should software developers and owners of flawed financial, accounting, simulation, or marketing systems be given liability protections as well Software and literature are extremely different. Software claims to actually perform a task rather than simply describe it, as a book does. Software users may also develop expectations of infallibility regarding software. Software is also harder to inspect than books and is harder to compare for quality with other software products. Given the importance of software in daily life, there is a good probability that liability law will be expanded to include software, even if the program just offers an information service.

Because telephone networks are governed common carriers, they have not been held accountable for the content sent. In exchange for their privilege to provide telephone service, businesses are required to ensure accessibility for everyone, charge fair prices, and achieve acceptable levels of dependability. But there are several federal and municipal restrictions on content and infrastructure that apply to broadcasters and cable television stations. With very few exceptions, websites in the US are not held accountable for anything put on them, regardless of whether it was added by the site owners or users.

System Quality

What is an acceptable, technologically achievable degree of system quality? This question arises in the discussion of responsibility and accountability for unintended effects of system usage. When should system administrators order "Stop testing; we've done all we can to make this program great. Send it! "People and organizations may be held accountable for preventable and predictable repercussions, which they owe it to themselves to recognize and address. Furthermore, there is a gray area since certain system flaws can only be predicted and corrected at very significant expenditure, making it uneconomical to pursue this degree of perfection. No one could buy the product.

For instance, software firms intentionally deploy flawed goods despite their efforts to debug them before releasing them to the market since the time and money required to remedy even tiny mistakes would prohibit these items from ever being published. Would social welfare not improve and possibly even fall if the product was not made available on the market? Taking this a step further, what exactly is a manufacturer of computer services responsible for—should it recall the imperfect product, alert the user, or just ignore the risk?

Software faults and problems, hardware or facility failures brought on by unforeseen events or other reasons, and poor input data quality are the three main causes of poor system performance. A 8 Learning Track explains why it is impossible to achieve zero faults in software code of any complexity and why it is impossible to gauge how critical the remaining problems are. Therefore, there is a technological barrier to creating software that is flawless, and users need to be informed of the possibility of disastrous failure. The testing criteria needed to create software with acceptable but subpar performance have not yet been established by the software industry.

Data quality is by far the most frequent cause of business system failure, despite the fact that news coverage of software defects and facility disasters is likely to be extensive. Although few businesses regularly assess the quality of their data, individual businesses report data error rates ranging from 0.5 to 30%.

Boundaries in Quality of Life

Along with the strength of the technology, the negative societal consequences of adopting information technologies and systems are starting to rise. Many of these unfavorable societal effects are neither crimes against property or breaches of individual rights. However, these unfavorable effects have the potential to do great damage to people, communities, and political systems. Despite the advantages they provide, computers and information technology have the potential to undermine important aspects of our culture and civilization. Whom do we hold accountable for the negative effects of information system use, if there are both positive and negative effects? We next quickly go through a few of the harmful social con-sequences of systems, taking into account personal, societal, and political reactions [4]–[6].

Power Balance: Center vs. Periphery

Big, centralized mainframe computers were feared to lead to a Big Brother society, as portrayed in George Orwell's book 1984, by consolidating authority in the nation's capital. Fears of power centralization in governmental organizations have decreased as a result of the trend toward highly decentralized computers, a philosophy of empowering thousands of people, and the decentralization of decision-making to lower organizational levels. However, a lot of the empowerment discussed in well-known business periodicals is unimportant. Minor choices may be delegated to lower-level personnel, but major policy decisions may still be made in a

centralized fashion. In parallel, corporate Internet goliaths like Google, Apple, Yahoo, Amazon, and Microsoft have taken control of the gathering and analysis of all people' private personal information. In this way, a small number of private oligopolies now have a greater amount of power.

Reduced Response Time to Competition Due to Rapidity of Change

Markets on a national and worldwide scale are now far more effective because to information systems. Due to today's more effective global market, firms no longer have the usual social safety nets that gave them years to adapt to competition. The downside of time-based competition is that your employer may not have enough time to react to international rivals and might go out of business in a year, costing you your job. We run the danger of becoming a "just-in-time society," with "just-in-time" workplaces, families, and vacations, as well as "just-in-time" employment.

Setting Boundaries for Family, Work, and Recreation

This book was written in parts on trains, aircraft, vacations, and during what would have otherwise been "family" time. Because it is truly becoming a reality, ubiquitous computing, telecommuting, nomad computing, mobile computing, and the "do anything anywhere" computer environment are at risk. The conventional divisions between job, family, and simple pleasure have eroded.

Despite the fact that writers have always written almost anywhere, the development of information technology together with the rise of knowledge-based jobs has led to an increase in the number of individuals working when they would normally be playing or communicating with loved ones. The term "work" now includes commute time, vacation time, and free time in addition to the eight-hour workday. These tight social bonds are threatened even by free time spent online.

Even for enjoyment or leisure, prolonged Internet usage keeps individuals away from their loved ones. It may result in detrimental antisocial conduct, such the current rise in cyberbullying, among middle school and adolescent kids. Risqué are obvious when these institutions are weakened.

Family and friends historically have been important sources of emotional support for people. They also serve as social checkpoints by protecting people's privacy, giving them a space to gather their thoughts, enabling them to harbor dreams, and protecting their right to live private lives.

Dependence and Exposure

Our modern corporations, governments, educational institutions, and non-profit organizations like churches rely heavily on information technologies, making them very susceptible if these systems malfunction. For instance, instructional software is used and relied upon more and more in secondary schools. Frequently, test results are kept off-campus. There is no substitute educational framework or body of knowledge that could replace these systems if they were to fail.

It is surprising to realize that there are no regulating or standard-setting bodies in existence that are comparable to those for telephone, electricity, radio, or other public utility technologies in an era when networks are as pervasive as the telephone system. Because there are no standards and certain system applications are crucial, there will likely be requests for national standards and maybe governmental control.

Computer abuse and crime

Computers and other new technology, such as them, provide up new chances for criminal activity by producing new valuable things to steal, new methods for doing so, and new means to hurt other people. The performance of unlawful activities using a computer or against a computer system is known as computer crime. Computers or computer systems may serve as both the target and the tool of a crime. It is now a federal felony to just access a computer system without authority or with the intention of doing damage, even accidentally. How prevalent is cybercrime? The Internet Crime Complaint Center, a collaboration between the Federal Bureau of Investigation and the National White Collar Crime Center, is one resource for information. The IC3 data may be used to determine the kinds of e-commerce offenses that customers are more likely to report. The IC3 received about 315,000 reports of Internet crime in 2011, which was the second-highest total in its eleven-year existence.

The total reported amount by the complainants, who made up more than half of the complainants, was close to $500 million. For those who reported financial losses, the average loss was over $4,100. Scams involving the FBI, identity theft, and advance fee fraud were the most often reported concerns. Another reliable resource is the yearly Computer Crime and Security Survey from the Computer Security Institute. 351 security professionals from American businesses, government organizations, financial institutions, healthcare facilities, and colleges participated in the poll in 2011. According to the poll, 46% of respondent firms had a computer security incident in the previous year. Malware infections were the most frequent sort of assault, followed by phishing scams, hardware theft from mobile devices and laptops, attacks from botnets, and insider misuse. It is believed that the real cost of all computer crime is in the billions of dollars. Although some individuals find working from home convenient, the "do anything anywhere" computer environment has the potential to erode the conventional distinctions between work and personal time.

Surveillance in the Workplace

The Blackburn Rovers Football Club in the UK employs more than 800 people, despite the fact that there are only 11 players on the field at any one time. Computers are the backbone of every modern organization and are essential to running a successful company. The administrative division of the club's Ewoud Park headquarters is where the majority of the club's computers are kept, however the training facility and soccer school also have some. The club made the decision to set up a software program called Spector 360 that it had purchased from Manchester-based Snap guard. The software provides corporate-wide surveillance of staff PC and Internet activity, claims Snap guard’s advertising brochure.

The club had previously attempted to implement an acceptable usage policy, but early negotiations with staff members stopped, and the policy was never put into effect. Early tests of Spector 360 revealed that some workers were taking advantage of the relaxed work environment by spending the majority of the day browsing the Web, accessing social networking sites, and using a significant amount of bandwidth for downloads. The AUP was revived prior to the monitoring software's formal implementation. It was included to the employee manual and sent as an email attachment.

Additionally, the policy was included to the terms and conditions of employment. Although the idea of being observed made some employees uncomfortable, the program was nevertheless set up. Ben Hayler, senior systems administrator at Blackburn Rovers, asserts that Spector 360 has unquestionably brought order back to the workplace while boosting productivity and lowering use of non-business applications [7]–[10]. The usage of chat services, the printing or storage of personal information, employee login and logout timings, excessive use of

Facebook, Twitter, and other social networking sites, visits to pornographic or retail websites, and excessive use of chat services are all things that Spector 360 reports may show managers. Managers may dive down using the program to examine use trends, create screenshots, or even record specific keystrokes. The usage of the program might also be advantageous to employees. For instance, the system may aid in staff training and problem solving since it is simple to trace the precise source of a certain issue because it can record exactly what an employee is doing.

The program also assists the club in maintaining compliance with the Payment Card Industry Data Security Standard, which is another significant advantage. Access to credit card data is necessary to comply with PCI regulations. The information may be readily retrieved since Spector 360 monitors and records every piece of information related to credit card transactions.

But what is the broader perspective of employee monitoring at work? The following, among other methods, are used by employers to keep tabs on their workers, according to the Citizens Advice Bureau: recording the workplace on CCTV cameras; opening mail or emails; using automated software to check emails; checking telephone logs or recording telephone calls; checking logs of Web sites visited; videotaping outside the workplace; obtaining information from credit reference agencies; and gathering information from point-of-sale terminals.

Despite the fact that this list may seem extensive, there is no disputing the employer's right to make sure that their workers are acting in a way that is lawful and beneficial to the business. However, in accordance with UK data protection legislation, the employer is required to make sure that the monitoring is necessary and to consider any unfavorable consequences the monitoring may have on the employees. Monitoring is not permitted for its own sake. Without the consent of the personnel, secret surveillance is often prohibited. Ms. Copeland, a worker at Carmarthenshire College, claimed that her right to privacy had been breached in a case that was heard by the European Court of Human Rights in 2007. She worked closely with the deputy principal, who initiated monitoring and analysis, and was the principal's personal assistant.

Of her phone bills, the websites she visited, and the emails she sent and received. The deputy principal was looking into whether Copeland was using the college's resources too much. Although this case was brought before the court in 2007, the monitoring took place in 1999, before the Regulation of Investigatory Powers Act 2000 and the Telecommunications Regulations 2001, which seek to clarify laws regarding telecommunications, were introduced into English and Welsh law. The European Court ruled in her favor, stating that her personal Internet usage was deemed to be under the definitions of the Convention for the Protection of Rights, covered as "private life."

Lack of a use policy was Carmarthenshire College's primary mistake. The employment contract should include an agreed-upon policy that specifies what is and is not acceptable computer use in the office. If an employee uses company property in a way that is prohibited by the employment contract, the employer may then implement the customary disciplinary measures. Whatever the legal status, it is obvious where potential issues with information technology usage in the workplace might arise. Once sent, an email is considered legally public and may be used as evidence in court proceedings regarding libel, contract disputes, and other concerns. To stay ahead of the competition, most firms depend on their corporate data. As a result, data loss, theft, or sabotage may be more harmful than comparable hardware issues. A few bucks will be needed to replace the hardware if a stick is lost in a bar parking lot, but if it contains sensitive information, the firm may go out of business!

The productivity of employees is a major priority for many businesses. Although it is quite simple to do so, if an employee has a real need to visit a site, a blanket ban on such sites might become problematic. Should websites be restricted around lunchtime as well? In any event,

workers are increasingly using their cellphones to access these sites, so barring them from desktop computers is no longer a guarantee of enhanced productivity. Employment: Job Losses Due to Trickle-Down Technology and Reengineering

The information systems community often hails reengineering work as a key advantage of new information technology. Less widely reported is the fact that millions of mid-level managers and office support staff have lost their jobs as a result of business process transformation. One economist has suggested that we might eventually have a tiny "high tech elite of corporate professionals" running everything. In a country where the jobless are all the time. Some economists have raised fresh concerns about the danger that information and computer technology pose to middle-class, white-collar occupations in 2011. According to Erik Brynjolfsson and Andrew P. McAfee, a combination of technologies, including robots, numerically controlled machines, computerized inventory management, pattern recognition, voice recognition, and internet commerce, has increased the rate of automation in recent years. As a consequence, numerous occupations that were previously only performed by people, such as tech assistance, contact center labor, X-ray examiners, and even legal document assessment, may now be performed by computers.

Some economists are significantly more upbeat about the possibility of job losses than others. They think that by removing intelligent, educated employees from reengineered positions, these workers will move on to better positions in rapidly expanding sectors. Unskilled blue-collar employees and older, less-educated middle managers are absent from this equation. The ease with which these people may be retrained for high-quality occupations is unclear. Companies may reorganize work to reduce job losses with the aid of careful planning and consideration for employee requirements.

Racial and Social Class Divisions Are Growing In Equity and Access

Does everyone in the digital era have an equal chance to participate? Will information systems technology help close the social, economic, and cultural disparities that exist in America and other societies? Or will the divisions widen, allowing the wealthy to outperform everyone else in terms of wealth because the effects of systems technology on different social groups have not been properly investigated, these questions have not yet received their complete answers. It is well established that many other information resources, including knowledge, computers, and access to them via educational institutions and public libraries, are inequitably distributed along racial and social class lines. Despite the fact that computer ownership and Internet access have increased dramatically over the last five years, many studies have indicated that poor and minority groups in the United States are less likely to have computers or online access. Higher-income families in each ethnic group are still more likely to have access to the Internet and home computers than lower-income families in the same group, despite the gap closing.

Schools in high-poverty locations are less likely to have computers, high-quality instructional technology programs, or Internet connection available for their kids, creating a comparable digital divide. If the digital gap is not closed, there might be a huge number of information have-nots who are computer illiterate and unskilled vs a society of information haves who are computer literate and talented.

Public interest organizations want to close this digital gap by ensuring that almost everyone has access to digital information services, such as the Internet, in a similar manner to how basic telephone service is already provided. The digital gap persists despite increased access to computers and other digital devices in recent years. The digital divide of today is built on both having access to and making use of digital technologies.

Health Hazards: Technostress, CVS, and RSI

Repetitive stress injury is now the most prevalent occupational ailment. RSI occurs when muscle groups are compelled to perform repetitive motions repeatedly under low-impact loads for tens of thousands of repetitions. Computer keyboards are the main cause of RSI. Carpal tunnel syndrome, in which pressure on the median nerve via the bone structure of the wrist called a carpal tunnel results in discomfort, is the most prevalent kind of RSI associated with computers. A word processor may make up to 23,000 keystrokes in a single shift, which contributes to the strain. Carpal tunnel syndrome symptoms include tingling, numbness, shooting pain, and difficulty grasping. Carpal tunnel syndrome has been identified in millions of people who work.

RSI may be prevented. Proper monitor stands, footrests, and workstations that support a neutral wrist position all help with good posture and RSI prevention. The option of ergonomic keyboards is also available. Frequent relaxation periods and staff duty rotation should be used to support these objectives. Computers may also lead to other occupational diseases than RSI. Poor ergonomic desk designs may also cause foot discomfort, leg tension, and back and neck pain. Any eye issue associated with using a display screen for handheld video games, e-readers, smartphones, or desktop or laptop computers is referred to as computer vision syndrome. About 90% of those who spend three hours or more each day on a computer are impacted by CVS. Headaches, impaired vision, and dry, itchy eyes are a few of its usually transient symptoms.

Technostress, or stress brought on by using a computer, is the most recent illness associated with computers. Anger, animosity toward others, irritability, and exhaustion are a few of its symptoms. Experts assert that people who spend a lot of time with computers develop the expectation that people and organizations would act much way computers do, with prompt replies, attention to detail, and a lack of emotion. High levels of early retirement from computer-intensive industries, high levels of employment turnover in the computer sector, and high levels of drug and alcohol misuse are all regarded to be associated with technological stress. Although the prevalence of technostress in the United States is unknown, it is estimated to be in the millions and rising. According to health data from various developed nations, the most stressful employment today are those that use computers.

CONCLUSION

In conclusion, Intellectual property rights face serious threats in the digital era, which threatens the financial incentives for innovation, creativity, and content production. The main issues that intellectual property rights holders must deal with include piracy, difficulties with cross-border enforcement, developing technology, and the need to strike a balance between access and protection. In order to address these issues, a comprehensive and cooperative strategy that includes legislative changes, technical advancements, and educational initiatives to safeguard intellectual property rights while encouraging innovation and information access is necessary. Along with these illnesses, computer technology may be altering our cognitive processes or at the very least impairing our ability to reason and solve issues.

Despite the fact that the Internet has made it simpler for individuals to access, produce, and utilize information, some experts fear it is also making it harder for people to concentrate and think effectively. Our lives now include the computer in a personal, social, cultural, and political sense. The challenges we face and the decisions we make are not expected to become any simpler as information technology continues to change our environment. As we enter the first century of the digital age, all the ethical and social challenges we have discussed are likely to become much more pressing given the expansion of the Internet and the information economy.

REFERENCES

[1] V. Kumar and K. Sinha, "Status and challenges of intellectual property rights in agriculture innovation in India," *J. Intellect. Prop. Rights*, 2015.

[2] P. Kudumakis, T. Wilmering, M. Sandler, V. Rodriguez-Doncel, L. Boch, and J. Delgado, "The Challenge: From MPEG Intellectual Property Rights Ontologies to Smart Contracts and Blockchains [Standards in a Nutshell]," *IEEE Signal Process. Mag.*, 2020, doi: 10.1109/MSP.2019.2955207.

[3] P. Ma, "Challenges and Countermeasures of Intellectual Property Rights in Network Environment," in *Advances in Intelligent Systems and Computing*, 2020. doi: 10.1007/978-981-15-1468-5_133.

[4] D. Rangnekar, "The challenge of intellectual property rights and social justice," *Development*, 2011, doi: 10.1057/dev.2011.48.

[5] E. Karakilic, "Rethinking intellectual property rights in the cognitive and digital age of capitalism: An autonomist Marxist reading," *Technol. Forecast. Soc. Change*, 2019, doi: 10.1016/j.techfore.2019.06.007.

[6] V. Luniachek, A. Brovdii, O. Kulakovskyi, and T. Varenko, "Academic Integrity in Higher Education of Ukraine: Current State and Call for Action," *Educ. Res. Int.*, 2020, doi: 10.1155/2020/8856251.

[7] J. A. Brander, V. Cui, and I. Vertinsky, "China and intellectual property rights: A challenge to the rule of law," *J. Int. Bus. Stud.*, 2017, doi: 10.1057/s41267-017-0087-7.

[8] C. Osunde, "Intellectual Property Rights in Nigerian Business Environment: Challenges and Prospects," *Intellect. Prop. Rights Open Access*, 2016, doi: 10.4172/2375-4516.100070.

[9] A. O. Titilope, "Intellectual Property Rights Protection in Nigeria," *Int. J. Libr. Inf. Serv.*, 2020, doi: 10.4018/ijlis.2020070103.

[10] M. Lukinović, L. Jovanović, and V. Šašo, "Challenges In Managing Intellectual Property Rights During Coronavirus Pandemic," in *Conference Proceedings (part of ITEMA conference collection)*, 2020. doi: 10.31410/itema.2020.239.