建立一个信息管理系统

在行政管理机构信息是个重要资源。及时有效的重要信息对于高效管理职能的表现是至关重要的例如准备组织领导控制。在一个管理机构中信息系统就像是人体中的神经系统它把组织的所有元件连接在一起而且还在竞争的环境中提供更好的操作和生存机会。

信息系统经常提及一个以计算机为基础的被设计成支持组织的操作、经营和决策功能的系统。在组织中信息系统为决策者提供信息支持。信息系统包含交易处理系统、管理信息系统、决策支持系统和战略的信息系统。

信息由经过处理的而且是对用户是有用的数据组成。一个系统是为了达成一个共同的目的共同操作的一组元件。因此一个管理信息系统收集传送处理储存而且在组织资源、程序表和成就上储存数据。系统进入经营信息之内为这些数据做合理的变换为决策者在组织里面的使用。因此一个管理信息系统提供支持组织管理职能的信息。

一、基本的概念

1、数据和信息的比较

数据提供未加工的、不被评估的事实数据、符号、物件、事件等等。数据可能是一个在于储存事实的集合物件像一个电话目录或者实施统计调查记录。

信息是那些已经进入一个有意义的有用的背景而且传达到一个使用它做出决断的接受人的数据。信息涉及智慧或知识的交流和接受。它评价而且通知吃惊而且刺激减少不确定现实另外可供选择的方案或者帮助去除无关的或者没用的信息还影响人们并且鼓励他们做出行动。数据的元素在一个特殊的背景下可能构成一条信息例如当你想联系你的朋友的时候他或者她的电话号码就是一条信息除此之外它在电话号码薄里仅仅是一个数据的元素。

2、信息的特性

好信息的特性是中肯的、时间性、准确性、成本效益、可靠性、可用性、无遗漏和凝聚层次。如果它引导改良的决策信息是有关的。如果它重新确定之前的决定它也是有关的。如果它对你的问题没有任何帮助那它就是无关的。例如如果你在一月考虑去巴黎那有关巴黎一月的天气情况的信息对你来说就是有关的。否则这信息就是无关的。

时间性涉及到信息的流通呈现给使用者。数据或信息的流通性是事件发生到它呈现给用户决策者之间的时间缺口。如果这个合计时间很短我们说这个信息系统是一个即时系统。

准确性是通过对数据和实际事件的比较而被测量的。准确无误的数据的重要性随着需要做出决断的型态而改变的。工资总支出信息必须是精确地。简单的近似值是不能满足需要的。不过对于全体员工的时间有多少是专注于特定的活动需要一个大致的估算这是不可或缺的。

3、信息的价值

在决策的制定上信息有着重要的作用因此它的价值紧紧系在使用它所做出的决断上。信息没有一个绝对的万用价值。它的价值关系到使用它的人们当它被用和在什么情况下被用。在这个意义上信息跟其它的商品有相似之处。例如对于一个在撒哈拉沙漠的人来说一杯水的价值就超过了一个在北极冰川迷路的人。

经济学家从招致生产或者获得商品的一个商品的成本或者价格来辨别价值。很显然产品的价值肯定比它的成本或者价格高让它变得有成本效益。

信息的标准价值的概念已经被经济学家和统计家发展而且它起源于决断理论。这个理论的基本前提是我们总是有一些与我们的决断相关的发生的事件的初步了解。额外的信息可能修改我们对事情发生或然率的观点因此改变我们的决定并且期望决定取得成功。因此额外的信息的价值是通过减少将来的事件的不确定性而获得预期结果的差额。

信息支持决定决定触发动作而动作影响组织的成就或绩效。如果我们可以测量出绩效中的差额我们就可以追踪信息的影响力进而可以假设测量小心地被执行在变数之中的关系定义得好而且不相关因素的可能结果被孤立。由于信息的因素绩效标准的差额叫做信息的现实价值或者显示价值。

对于大部分的信息系统来说特别是那些支持中层和最高管理部门的人们产生的决断时常与不严格被定义而且包括不能够被定量的或然率的事件有关。决策程序时常是模糊的而且结果因多重的、无比的大小而依比例决定的。在一些情况下我们可能尝试执行一个多属性分析或者得到一个大体上主观的价值。主观的价值反映了人们对于信息的综合印象和他们愿意为特定信息支付的价值Ahituv, Neumann, & Riley, 1994。

4、对于决策来说信息是一个助手

西蒙1977把决策的程序说成是包含四个阶段 智力、设计、选择和评论。智力阶段包含与组织和它的环境有关的数据的集合物件、分类、加工和说明。这对于识别环境需求的决策是很重要的。在设计阶段期间决策者提出可供选择的方案每个解决方案都包含一系列需要被执行的动作。在智力阶段被收集的数据现在被统计其他的模型为每一个选择预测可能发生的结果。每一个选择也要从技术可行性、行为可行性和经济可行性方面去检验。在选择阶段决策者必须要选择出一个对组织的目标贡献最大的方案。经过选择可以让经理受制于实施和监听期间并且从错误中学习。信息在决断程序的所有的四个阶段中扮演着重要的角色。

5、管理信息系统的分类

管理信息系统有多种类型。梅森和斯旺森1981把管理信息系统分为四个类型1数据库信息系统2预言性的信息系统3制定决策的信息系统4决策执行的信息系统。这个分类是以在决策制定的过程中信息系统可以提供的支持程度为基础的。Sachdeva1990综合地呈现了这四种类型

数据库信息系统。这类信息系统的责任是观察分类而且存储那些对决策者可能有用的任何数据项目。

预言性的信息系统。这一个系统随着时间的过去超越纯粹的数据收集和倾向的决定。 预言性的信息系统为与做出决策相关的推论和先前预测的事物提供制图。如果上述的例子会被这样用那么为先前预测或者画理论图获得有用的信息就是可能的。

制定决策的信息系统。这个系统距离决策制定的程序更近一步而且它包含组织系统的价值或这它是各种可供选择的方案的选择标准。一个组织的额外价值有很多而且形式多样。它们包括解决农民问题增加和规定了农民的基本收入提高农民的生活质量的焦虑。但是她们也包含、规定了 农民的基本收入和改善农民的生活质量。但是他们也含一个为职员好好地提供训练、适当的薪金等等意图和在乡下的经济发展的程序中提供援助的意图。

决策执行的信息系统。决策执行的信息系统的例子在扩充的组织中是不容易被找到的。在信息系统中它是一个决策系统而且决策者只有一个而且是同一个。对于系统本身它基本上可以削弱它增加动作的权利因此在这个系统中当假设被结合的时候经营是如此的自信。飞机加载的自动飞行系统就是决策执行系统的一个案例。一旦飞机被启动系统自身就会保持飞机在正确的方向上以适当的速度和高度依照飞行员决定的参数飞行。另外一个决策执行信息系统的例子是在调制解调器工厂的生产中被应用。在汽车生产中通过计算机汽车零配件的清单被连续不断的保存就像汽车移动走的流水线一样。当其他部分需要零配件的时候计算机就会自动的下命令。这是不需要管理者的介入的。

二、在农业扩充的管理计划中MIS的角色

国家的扩充系统尤其是在发展中国家一般倾向于很庞大。例如在印度国家的农业延伸系统雇佣了大约125000人。在不同层次扩充的管理者需要相关的信息来做出高效的决策。如果缺少了这些信息那么他们的决策也仅仅是依据他们的最基本的直觉和以往的经验。那些经过处理存储和合理出现的数据会辅助他们分析问题和做出高效的决定。

就像上面所建议的那样在每一个管理程序的过程中管理者需要信息去帮助他们做出高效的决策。这样的信息我们叫做管理信息。它不包含纯粹功能上的信息或者技术上的信息像是大米或者小麦耕种的常规软件包。管理信息是管理者必须的信息就像他们做出决定比如按类别要扩充的人员就业的数目他们的培训要求职业发展规划工作说明预算预测基点审视报道被服务的人们的社会经济状况和目前的设备Ramesh Babu & Singh, 1987。

三、需要自动化

一个自动化的信息管理系统包含的数据仅仅像是由手工系统做出来的。它接收输入加工输入和递送像输出一样的加工输入。当其他的要求数据被记录在一个输入媒介比如磁性材料特别地涂上一层的塑料易曲的或软式磁盘和磁带上时一些输入设备允许直接的人机交互。直接地被连接到一部计算机的工作区的键盘就是直接输入设备的一个例子。自动化的使用让存储大量的信息变得有可能而且还避免了找到他们手工记录的路径时的错误还有那些在人工系统中实际上是不可能比较和计算的错误。

四、数据库的组织 数据通常是经过交易处理系统在栏位层次上产生的但是一旦信息被取得假如信息需求已经很好的被定义适当的程序表已经被执行而且一个方法已经被安排为共享数据那么任何组织领导层的延伸阶层都可以使用它们。这就暗示着同一个数据可以同时被多个不同集合的程序表所使用因此我们可以看出数据数据的集合和应用程序的集合的区别。在一个决策支持系统DSS中一系列的程序集是模型的基础Keen &Morton1978。

期间数据库可能提及可以为一个机构内各部门服务的数据集合。在给定的题目上的数据库是一个数据集合在那个给定的题目上要遵循三个准则广泛性完整性、非冗余的、和适当的结构。广泛性意味着所有关于数据的题目都在数据库中实际出现过。非冗余意味着早数据库中每个独立的数据条只存在唯一一次。适当的结构意味着数据用一种像是使最小预期加工和存储成本的方法进行存储(Awad & Gotterer, 1992).。

能够灵活的被那些应用程序或者样板基层共享的大型企业的数据库的想法已经被那些软件包特别是执行如此认为的软件包所了解。这些被叫做数据库管理系统DBMSs的包在不同商品名称下面的市场中都是可得的比如ORACLE, SYBASE, INGRES, FOXBASE, and dBASE.

五、以计算机为基础说明的MIS

一个国家农业扩充系统是被国家政府管理的全国范围的系统。在印度在全国性和状态层次之间的权力分割之下农业是一个政府话题。然而国家政府补充财政资源的状态而且在国家的层次上提供调和。政府的行政机构被划分为区域区域进入细分之内进入区块之内的细分。一个区块是一组村庄的集合也是农业扩充程序表管理的基本单位。在区块层次收集的数据需要在高级的管理层次被整合在区域和州的层次上提供一个整合的意见用以支持计划、监听和决策制定。

然而，实际的设计可能会随着政府的大小和其他因素而改变。为了整个的政府一个整合的数据库可能在政府总部被一个主机/迷你计算机所支持。为了数据的分析适当的程序表可能被设计成在状态层次提供交互式决策支持系统。根据要处理的数据的容量每个区域和细分有可能具有一台迷你/微计算机。在区域和细分的计算机很有可能与政府计算机同属于一个网络。在区域/细分本地数据可能被存储和处理而被共享的数据可能会以适当程度的聚合被传送到政府总部更新整合的数据库。区域和细分会通过他们的密码使用指定给他们的适当的权限直接访问整合的数据库。区块可能只使输入-输出终端机被连接到细分计算机为区域提供数据有必要的时候作为在线查询。

Establishing a management information system

Information is a critical resource in the operation and management of organizations. Timely availability of relevant information is vital for effective performance of managerial functions such as planning, organizing, leading, and control. An information system in an organization is like the nervous system in the human body: it is the link that connects all the organization's components together and provides for better operation and survival in a competitive environment.

The term information system usually a computer-based system, one that is designed to support the operations, management, and decision functions of an organization. Information systems in organizations thus provide information support for decision makers. Information systems encompass transaction processing systems, management information systems, decision support systems, and strategic information systems.

Information consists of data that have been processed and are meaningful to a user. A system is a set of components that operate together to achieve a common purpose. Thus a management information system collects, transmits, processes, and stores data on an organization's resources, programmes, and accomplishments. The system makes possible the conversion of these data into management information for use by decision makers within the organization. A management information system, therefore, produces information that supports the management functions of an organization (Davis & Olson, 1985; Lucas, 1990; McLeod, 1995).

Basic concepts

Data versus Information

Data refers to raw, unevaluated facts, figures, symbols, objects, events, etc. Data may be a collection of facts lying in storage, like a telephone directory or census records.

Information is data that have been put into a meaningful and useful context and communicated to a recipient who uses it to make decisions. Information involves the communication and reception of intelligence or knowledge. It appraises and notifies,surprises and stimulates, reduces uncertainty, reveals additional alternatives or helps eliminate irrelevant or poor ones, and influences individuals and stimulates them to action. An element of data may constitute information in a specific context; for example, when you want to contact your friend, his or her telephone number is a piece of information; otherwise, it is just one element of data in the telephone directory.

Characteristics of Information

The characteristics of good information are relevance, timeliness, accuracy, cost-effectiveness, reliability, usability, exhaustiveness, and aggregation level. Information is relevant if it leads to improved decision making. It might also be relevant if it reaffirms a previous decision. If it does not have anything to do with your problem, it is irrelevant. For example, information about the weather conditions in Paris in January is relevant if you are considering a visit to Paris in January. Otherwise, the information is not relevant.

Timeliness refers to the currency of the information presented to the users. Currency of data or information is the time gap between the occurrence of an event in the field until its presentation to the user (decision maker). When this amount of time is very short, we describe the information system as a real-time system.

Accuracy is measured by comparing the data to actual events. The importance of accurate data varies with the type of decisions that need to be made. Payroll information must be exact. Approximations simply will not suffice. However, a general estimate of how much staff time was devoted to a particular activity may be all that is needed.

Value of Information

Information has a great impact on decision making, and hence its value is closely tied to the decisions that result from its use. Information does not have an absolute universal value. Its value is related to those who use it, when it is used, and in what situation it is used. In this sense, information is similar to other commodities. For example, the value of a glass of water is different for someone who has lost his way in Arctic glaciers than it is to a wanderer in the Sahara Desert.

Economists distinguish value from cost or price of a commodity incurred to

produce or procure the commodity. Obviously, the value of a product must be higher than its cost or price for it to be cost-effective.

The concept of normative value of information has been developed by economists and statisticians and is derived from decision theory. The basic premise of the theory is that we always have some preliminary knowledge about the occurrence of events that are relevant to our decisions. Additional information might modify our view of the occurrence probabilities and consequently change our decision and the expected payoff from the decision. The value of additional information is, hence, the difference in expected payoff obtained by reduced uncertainty about the future event.

Information supports decisions, decisions trigger actions, and actions affect the achievements or performance of the organization. If we can measure the differences in performance, we can trace the impact of information, provided that the measurements are carefully performed, the relationships among variables are well defined, and possible effects of irrelevant factors are isolated. The measured difference in performance due to informational factors is called the realistic value or revealed value of information.

For most information systems, particularly those supporting middle and top management, the resulting decisions often relate to events that are not strictly defined and involve probabilities that cannot be quantified. The decision-making process often is obscure and the outcomes are scaled by multiple and incomparable dimensions. In such cases, we may either attempt to perform a multiattribute analysis or derive an overall subjective value. The subjective value reflects people's comprehensive impression of information and the amount they are willing to pay for specific information (Ahituv, Neumann, & Riley, 1994).

Information as an Aid to Decision Making

Simon (1977) describes the process of decision making as comprising four steps: intelligence, design, choice, and review. The intelligence stage encompasses collection, classification, processing, and presentation of data relating to the organization and its environment. This is necessary to identify situations calling for decision. During the decision stage, the decision maker outlines alternative solutions,each of which involves a set of actions to be taken. The data gathered during the intelligence stage are now used by statistical and other models to forecast possible outcomes for each alternative. Each alternative can also be examined for technological, behavioural, and economic feasibility. In the choice stage, the decision maker must select one of the alternatives that will best contribute to the goals of the organization. Past choices can be subjected to review during implementation and monitoring to enable the manager to learn from mistakes. Information plays an important role in all four stages of the decision process.

Classification of Management Information Systems

There are various types of management information systems. Mason and Swanson (1981) describe four categories of management information systems: (1) databank information system, (2) predictive information system, (3) decision-making information system, and (4) decision-taking information system. The classification is based on the level of support that the information system provides in the process of decision making. Sachdeva (1990) comprehensively presents these four types of systems:

Databank Information System. The responsibility of this information system is to observe, classify, and store any item of data which might be potentially useful to the decision maker.

Predictive Information System. This system moves beyond pure data collection and the determination of trends over time. Predictive information systems provide for the drawing of inferences and predictions that are relevant to decision making. If data from the above examples were to be used in this way, it is possible to obtain information useful for making predictions or for drawing inferences.

Decision-Making Information System. This system goes one step further in the process of decision making and incorporates the value system of the organization or its criteria for choosing among alternatives. An extension organization's values are many and varied. They include concerns for resolving farmer problems, increasing and providing for stability of farmer incomes, and improving the quality of farm life. But they also including and providing for stability of farmer incomes, and improvingthe quality of farm life. But they also include an intent to provide well for staff members (training, adequate salaries, etc.) and to aid in the process of bringing about rural economic development.

Decision-Taking Information System. Examples of decision-taking information systems are not usually found in an extension organization. This is a decision system in which the information system and the decision maker are one and the same. Management is so confident in the assumptions incorporated in the system that it basically relegates its power to initiate action to the system itself. Airplanes carry automatic pilot systems, which are an example of a decision-taking system. Once activated, the system itself keeps the plane on course and at the proper speed and altitude (according to parameters determined by the pilot). Another example of decision-taking information systems is found in modem factory production. In automobile production, continuous inventories of parts are maintained by computer as cars move down an assembly line. Orders are placed automatically by the computer when additional parts are needed. This is done without the intervention of a manager.

Role of MIS in the management of agricultural extension programmers National agricultural extension systems, especially in developing countries, tend to be very large. For example, in India, the national agricultural extension system employs about 125,000 people. Extension managers at various levels need relevant information in order to make effective decisions. In the absence of such information, they act only on the basis of their intuition and past experience. Data that have been processed, stored, and presented properly will aid them in analysing situations and to make effective decisions.

As suggested above, at every phase of the management process, managers need information in order to make effective decisions. This we call management information. It does not include purely functional information or technical information, such as packages of practices for rice or wheat cultivation. Management information is the information required by managers as they make their decisions, such as the number of extension personnel employed by category, their training requirements, career development plans, job descriptions, budgets, forecasts,

benchmark surveys, reports on socioeconomic conditions of people served, and existing facilities (Ramesh Babu & Singh, 1987).

Need for automation

An automated MIS system contains data just as a manual system does. It receives input, processes input, and delivers the processed input as output. Some input devices allow direct human-machine communication, while others require data to be recorded on an input medium such as a magnetizable material (specially coated plastic flexible or floppy disks and magnetic tapes). The keyboard of a workstation connected directly to a computer is an example of a direct input device. Use of automation makes it possible to store immense quantities of information, to avoid many of the errors that find their way into manual records, and to make calculations and comparisons that would be practically impossible in a manual system.

Organization of a database

Data are usually generated at the field level through transaction-processing systems, but once the data are captured, any echelon along the organizational hierarchy may use them, provided that information requirements have been well defined, appropriate programmers have been implemented, and a means has been arranged for the sharing of the data. This would imply that the same data can be used by different sets of programmers; hence we distinguish between the database (a set of data) and the applications (a set of programmers). In a decision support system (DSS), this set of programmers is the model base (Keen & Morton, 1978).

The term database may refer to any collection of data that might serve an organizational unit. A database on a given subject is a collection of data on that subject that observes three criteria: comprehensiveness (completeness), nonredundancy, and appropriate structure. Comprehensiveness means that all the data about the subject are actually present in the database. Nonredundancy means that each individual piece of data exists only once in the database. Appropriate structure means that the data are stored in such a way as to minimize the cost of expected processing and storage (Awad & Gotterer, 1992).

The idea of a large corporate database that can be flexibly shared by several applications or model bases has been realized by means of software packages specially devised to perform such tasks. These packages, called database management systems (DBMSs), are available in the market under different trade names such as ORACLE, SYBASE, INGRES, FOXBASE, and dBASE.

Illustrative computer-based MIS

A national agricultural extension system is a nationwide system managed by the national government. In India, agriculture is a state subject under the division of powers between the national and the state levels. Nevertheless, the national government supplements the financial resources of the states and provides coordination at the national level. The state's administrative machinery is divided into districts, districts into subdivisions, subdivisions into blocks. A block is a group of villages and the basic unit for the administration of an agricultural extension programmer. Data collected at the block level need to be integrated at higher administrative levels to provide an integrated view at the district and state levels to support planning, monitoring, and decision making.

However, the actual design may vary with the size of the state and other considerations. An integrated database for the entire state may be supported by a mainframe/minicomputer at the state headquarters. Suitable programmes for the analysis of data may be designed to provide an interactive decision support system at the state level. Each district and subdivision may be provided with a mini/micro computer, depending on the volume of data to be handled. The computers in the districts and subdivisions may be networked with the state computer. The local data may be stored and processed in the district/subdivision, and the shared data with appropriate level of aggregation may be transmitted to the state headquarters to update the integrated database. The districts and subdivisions would have direct access to the integrated database with proper authorizations assigned to them through their passwords. The blocks may have only the input-output terminals connected to the subdivision computer to feed data to the subdivision and make on-line inquiries as and when necessary.

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