DOWNLOAD PDF WORK SYSTEM DESIGN NOTES

Chapter 1 : Work systems - Wikipedia

Role of Work Study in Improving Productivity. In order to understand the role of work study, we need to understand the role of method study and that of time study. Method study (also sometimes called Work Method Design) is mostly used to improve the method of doing work. It is equally applicable to new jobs.

Job Design and Work Measurement - Review Notes Job Design Techniques Operating managers have to plan and organize production processes and systems, acquire resources for running the systems and produce using the systems. Human resources is an important component of resources to be acquired by an operations managers. For each person, a job needs to be designed so that operators and employees can be effective and efficient. Effectiveness means operators produce the required feature of the product or service with the specified process satisfying the specifications of the output. Efficiency refers to the resources consumed by the operator including his own time and rework done and items scrapped. Industrial engineering has special focus on efficiency dimension. Each process designed must be tested by operations managers to make sure it produces the required feature of product or service. An operations manager uses job design techniques to structure work to meet the physical and behavioral needs of the employee. Organization management principles are used to come out with various jobs in an organization. Industrial engineering techniques like motion study, work station design and ergonomics help in developing the most efficient method at a point time. Work measurement methods are used to determine the standard time for performing a given task. Also, standard time estimates permit better planning and costing and provide a basis for compensating the work force and even providing incentives. Today many workers are cross-trained to perform multiskilled jobs and total quality programs are important for all employees. Team approaches, informating, use of temporary workers, automation, and organizational commitment are other key issues in job design decisions. Behavioral considerations in job design include how specialized a job will be. Specialization has unique advantages and disadvantages. At the other extreme from specialization are the concepts of job enlargement and job enrichment. Sociotechnical systems of the interaction between technology and the work group influence job design as do ergonomic or physical consideration. Work methods determine how the work should be accomplished in organizations. Methods efficiency engineering or method study is the classical IE tool for this purpose. Inspection methods and maintenance methods can be also be analyzed using methods study. Work methods can be established for an overall productive system, a worker alone, a worker interacting with equipment, and a worker interacting with other individuals. When individual workers are considered, motion study becomes the technique. Work measurement and standards exist to set time standards for a job. A basic technique used in work measurement is the stop watch time study. Now comprehensive predetermined motion time systems are available to set standards based on process plans. Time studies can be done for production jobs or for nursing jobs. Work sampling is a work measurement technique using samples instead of full time time study. Another issue in job design is the financial incentive plan. These plans determine how workers should be compensated for their differences in production output over long periods of time. Persons who are consistently producing more output for number of days expect more compensation. In preparing a financial incentive plan, management must consider individual, group, and organization wide rewards. Once a job is designed operators have to be trained in it. Each manager is a teacher or a trainer. Right from the first-line supervisor or foreman to the CEO have to act as teachers or trainers when the occasion demands. Improvement in both effectiveness and efficiency demand involvement of operations managers as teachers, trainers and coaches.

DOWNLOAD PDF WORK SYSTEM DESIGN NOTES

Chapter 2 : Systems Analysis and Design/Introduction - Wikibooks, open books for an open world

AQWorlds - Design Notes: Go behind-the-scenes to find the continuing game development of our online RPG to learn how a real-time MMO is made with news about AdventureQuest Worlds.

SSADM can be thought to represent a pinnacle of the rigorous document-led approach to system design, and contrasts with more contemporary agile methods such as DSDM or Scrum. SSADM made mandatory for all new information system developments Version 4 launched The method was repackaged into 15 modules and another 6 modules were added. Logical data modeling The process of identifying, modeling and documenting the data requirements of the system being designed. The result is a data model containing entities things about which a business needs to record information , attributes facts about the entities and relationships associations between the entities. Data Flow Modeling The process of identifying, modeling and documenting how data moves around an information system. Data Flow Modeling examines processes activities that transform data from one form to another , data stores the holding areas for data , external entities what sends data into a system or receives data from a system , and data flows routes by which data can flow. Entity Event Modeling A two-stranded process: Entity Behavior Modeling, identifying, modeling and documenting the events that affect each entity and the sequence or life history in which these events occur, and Event Modeling, designing for each event the process to coordinate entity life histories. Stages[edit] The SSADM method involves the application of a sequence of analysis, documentation and design tasks concerned with the following. Stage 0 â€" Feasibility study[edit] In order to determine whether or not a given project is feasible, there must be some form of investigation into the goals and implications of the project. For very small scale projects this may not be necessary at all as the scope of the project is easily understood. When a feasibility study is carried out, there are four main areas of consideration: Technical â€" is the project technically possible? Financial â€" can the business afford to carry out the project? Organizational â€" will the new system be compatible with existing practices? Ethical â€" is the impact of the new system socially acceptable? To answer these questions, the feasibility study is effectively a condensed version of a fully blown systems analysis and design. The requirements and users are analyzed to some extent, some business options are drawn up and even some details of the technical implementation. The product of this stage is a formal feasibility study document. SSADM specifies the sections that the study should contain including any preliminary models that have been constructed and also details of rejected options and the reasons for their rejection. Stage 1 â€" Investigation of the current environment[edit] The developers of SSADM understood that in almost all cases there is some form of current system even if it is entirely composed of people and paper. Through a combination of interviewing employees, circulating questionnaires, observations and existing documentation, the analyst comes to full understanding of the system as it is at the start of the project. This serves many purposes. Stage 2 â€" Business system options[edit] Having investigated the current system, the analyst must decide on the overall design of the new system. To do this, he or she, using the outputs of the previous stage, develops a set of business system options. These are different ways in which the new system could be produced varying from doing nothing to throwing out the old system entirely and building an entirely new one. The analyst may hold a brainstorming session so that as many and various ideas as possible are generated. The ideas are then collected to options which are presented to the user. The options consider the following: The users and analyst together choose a single business option. This may be one of the ones already defined or may be a synthesis of different aspects of the existing options. The output of this stage is the single selected business option together with all the outputs of the feasibility stage. Using the requirements developed in stage 1 and working within the framework of the selected business option, the analyst must develop a full logical specification of what the new system must do. The specification must be free from error, ambiguity and inconsistency. By logical, we mean that the specification does not say how the system will be implemented but rather describes what the system will do. To produce the logical specification, the analyst builds the required logical models for both the data-flow diagrams DFDs and the Logical Data Model LDM , consisting of the Logical Data Structure referred to in other methods as entity relationship diagrams and full descriptions of the data and its

relationships. These are used to produce function definitions of every function which the users will require of the system, Entity Life-Histories ELHs which describe all events through the life of an entity, and Effect Correspondence Diagrams ECDs which describe how each event interacts with all relevant entities. These are continually matched against the requirements and where necessary, the requirements are added to and completed. The product of this stage is a complete requirements specification document which is made up of:

DOWNLOAD PDF WORK SYSTEM DESIGN NOTES

Chapter 3 : Work System Design - Course

Systems analysis incorporates initial systems design. Prepare interview notes work beyond that permitted in Section of the

Work System Design deals with the systematic examination of the methods of doing work with an aim of finding the means of effective and efficient use of resources and setting up of standards of performance for the work being carried out. And how it is done? As well as what is the standard time to do the work? This is required to have an in-depth analysis of all the elements, factors, resources and relationships affecting the efficiency and effectiveness of the work being studied. The course also aims at scientifically establishing the time required for a qualified worker to carry out a work element at a defined rate of working. Ergonomic aspects of work system design are also included in the course contents. The scope of this course is not only limited to the manufacturing applications but it is also relevant for service sector industry. All the industries using work system theory to improve their productivity and effectiveness. He has developed suitable pedagogical methods for two under-graduate courses of Mechanical Engineering. Basic Concept, Industrial Ergonomics, Ergonomics: Office Chair, Case Study: Tower Crane Cabin, Case Study: Car Seat, Case Study: Computer System, Case Study: Introduction to Work Study: Barnes, Wiley, The University of California. Industrial Engineering and Production Management: Chand and Company Ltd. The exam is optional for a fee. October 28 Sunday Time of Exams: Morning session 9am to 12 noon; Afternoon session: Announcements will be made when the registration form is open for registrations. The online registration form has to be filled and the certification exam fee needs to be paid. More details will be made available when the exam registration form is published. Final score will be calculated as: Certificate will have your name, photograph and the score in the final exam with the breakup. It will be e-verifiable at nptel.

Chapter 4 : What is System Design? - Definition from Techopedia

Chapter 7: Design of Work Systems Introduction and Job Design - work system design involves job design (content and method), determination of working conditions, work measurement (i.e., establishment of standard times), and compensation - work design is one of the oldest activities in operations management, and was the main focus of scientific management (later called industrial engineering.

You may also need to comply with other City agency requirements, for example: Guidelines for Submission of Sprinkler Project Plans A pre-design review should cover all existing sprinkler systems and components affected by the proposed scope of work to verify code-compliant repair work, or modifications to the sprinkler systems within the building. In particular changes to the building layout, occupancy and the hazard of the building contents will impact the design of the sprinkler systems design. Based upon the complexity and scale of the project, the information provided on the sprinkler drawings should show a clear description of the work required for the project. Although the Department does not mandate the organization and style of construction documents, the guidelines outlined in this chapter should provide a consistent approach for preparation of construction documents that will facilitate the plan review process. In many cases, the project may involve the documentation of existing sprinkler systems and should clearly identify new versus existing systems. Complete Submission of Sprinkler Work Drawings The sprinkler drawings represent work that is closely coordinated with many other disciplines such as architectural, structural, electrical, and mechanical, to ensure coordination with other disciplines. Drawings necessary to convey essential information such as schedules, riser diagrams, floor layout, mounting details, seismic details, and control diagrams. The title page should clearly define the project location and vicinity by graphical means. The applicable Building Codes and notes should be stated on the drawings. A drawing index is recommended to clearly identify all the unique systems that may be involved in the proposed work. All sprinkler filing should include a diagrammatic site plan identifying the location of the work within the building and if exterior work or water service is affected then indicating the location of that work. For example, fire department connections, fire water service relays and backflow devices should be clearly indicated. Sprinkler floor plans showing existing and proposed conditions with the location of all sprinkler components, including location, size, spacing of piping, valves, feed mains, sprinkler heads and other essential features of the system. Traditionally, the floor plans provide the documentation of the architectural features as a shaded background and the sprinkler fixtures are prominently shown on top of these locations. However, it is important to clearly identify room names and penetrations of fire-rated walls and other assemblies. It is recommended to follow the architectural floor plan nomenclature for sheet order and sheet numbering in order to simplify the logical sequence of cross-coordination with all trades disciplines. A complete sprinkler or combination fire standpipe riser diagram is required for all sprinkler systems, showing the relevant portions of the existing building system and that portion of the system being modified. The diagram should clearly indicate flow switches and backflow devices. The diagram should include the available water pressure and the source of the water at the floors where the work is proposed, as well as the water pressure and source upon entering the building. Significant details should be illustrated on the plans. For hydraulically calculated systems, hydraulic data substantiating pipe sizes shown shall be submitted and hydraulic reference points and areas must be indicated on the plan. Some key elements required on plans for all projects include: Submission of Construction Documents 1. The sprinkler drawings should reflect clear scope of work and include all affected systems. Examples of this are as follows: Designator - Sheet Number:

Chapter 5 : NPTEL :: Mechanical Engineering - Industrial Engineering

Job Design and Work Measurement - Review Notes Job Design Techniques Operating managers have to plan and organize production processes and systems, acquire resources for running the systems and produce using the systems.

The static view is summarized by the work system framework, which identifies the basic elements for understanding and evaluating a work system. An easily recognized triangular representation of the work system framework has appeared in Alter , , , and elsewhere. The work system itself consists of four elements: Customers may also be participants in a work system, as happens when a doctor examines a patient. This framework is prescriptive enough to be useful in describing the system being studied, identifying problems and opportunities, describing possible changes, and tracing how those changes might affect other parts of the work system. The definitions of the 9 elements of the work system framework are as follows: Processes and activities include everything that happens within the work system. The term processes and activities is used instead of the term business process because many work systems do not contain highly structured business processes involving a prescribed sequence of steps, each of which is triggered in a pre-defined manner. Other perspectives with their own valuable concepts and terminology include decision-making, communication, coordination, control, and information processing. Participants are people who perform the work. Some may use computers and IT extensively, whereas others may use little or no technology. When analyzing a work system the more encompassing role of work system participant is more important than the more limited role of technology user whether or not particular participants happen to be technology users. In work systems that are viewed as service systems, it is especially important to identify activities in which customers are participants. Information includes codified and non-codified information used and created as participants perform their work. Information may or may not be computerized. Data not related to the work system is not directly relevant, making the distinction between data and information secondary when describing or analyzing a work system. Knowledge can be viewed as a special case of information. Technologies include tools such as cell phones, projectors, spreadsheet software, and automobiles and techniques such as management by objectives, optimization, and remote tracking that work system participants use while doing their work. This may include physical products, information products, services, intangibles such as enjoyment and peace of mind, and social products such as arrangements, agreements, and organizations. Customers of a work system often are participants in the work system e. Environment includes the organizational, cultural, competitive, technical, and regulatory environment within which the work system operates. These factors affect system performance even though the system does not rely on them directly in order to operate. Infrastructure includes human, informational, and technical resources that the work system relies on even though these resources exist and are managed outside of it and are shared with other work systems. Technical infrastructure includes computer networks, programming languages, and other technologies shared by other work systems and often hidden or invisible to work system participants. Strategies include the strategies of the work system and of the department s and enterprise s within which the work system exists. Strategies at the department and enterprise level may help in explaining why the work system operates as it does and whether it is operating properly. Work system life cycle model[edit] The dynamic view of a work system starts with the work system life cycle WSLC model, which shows how a work system may evolve through multiple iterations of four phases: The names of the phases were chosen to describe both computerized and non-computerized systems, and to apply regardless of whether application software is acquired, built from scratch, or not used at all. This model encompasses both planned and unplanned change. Planned change occurs through a full iteration encompassing the four phases, i. Unplanned change occurs through fixes, adaptations, and experimentation that can occur within any phase. The phases include the following activities: Operation and maintenance[edit] Operation of the work system and monitoring of its performance Maintenance of the work system which often includes at least part of information systems that support it by identifying small flaws and eliminating or minimizing them through fixes, adaptations, or workarounds. On-going improvement of processes and activities through analysis, experimentation, and adaptation Vision for the new or revised work system

Operational goals Allocation of resources and clarification of time frames Economic, organizational, and technical feasibility of planned changes Development[edit] Detailed requirements for the new or revised work system including requirements for information systems that support it As necessary, creation, acquisition, configuration, and modification of procedures, documentation, training material, software and hardware Debugging and testing of hardware, software, and documentation Implementation approach and plan pilot? The first sales system is the CEO selling directly. As the firm grows, the sales system becomes regionalized and an initial version of sales tracking software is developed and used. Later, the firm changes its sales system again to accommodate needs to track and control a larger salesforce and predict sales several quarters in advance. A subsequent iteration might involve the acquisition and configuration of CRM software. The first version of the work system starts with an initiation phase. Each subsequent iteration involves deciding that the current sales system is insufficient; initiating a project that may or may not involve significant changes in software; developing the resources such as procedures, training materials, and software that are needed to support the new version of the work system; and finally, implementing the new work system. The pictorial representation of the work system life cycle model places the four phases at the vertices of rectangle. Forward and backward arrows between each successive pair of phases indicate the planned sequence of the phases and allow the possibility of returning to a previous phase if necessary. To encompass both planned and unplanned change, each phase has an inward facing arrow to denote unanticipated opportunities and unanticipated adaptations, thereby recognizing the importance of diffusion of innovation, experimentation, adaptation, emergent change, and path dependence. The work system life cycle model is iterative and includes both planned and unplanned change. It is fundamentally different from the frequently cited Systems Development Life Cycle SDLC , which actually describes projects that attempt to produce software or produce changes in a work system. Current versions of the SDLC may contain iterations but they are basically iterations within a project. More important, the system in the SDLC is a basically a technical artifact that is being programmed. In contrast, the system in the WSLC is a work system that evolves over time through multiple iterations. That evolution occurs through a combination of defined projects and incremental changes resulting from small adaptations and experimentation. It has evolved iteratively starting in around At each stage, the then current version was tested by evaluating the areas of success and the difficulties experienced by MBA and EMBA students trying to use it for a practical purpose. In a research setting, Petrie used the work system framework as a basic analytical tool in a Ph. Petkov and Petkova demonstrated the usefulness of the work system framework by comparing grades of students who did and did not learn about the framework before trying to interpret the same ERP case study. More recent evidence of the practical value of a work system approach is from Truex et al. These briefings contained the kind of analysis that would be discussed in the initiation phase of the WSLC, as decisions were being made about which projects to pursue and how to proceed. Results from analyses of real world systems by typical employed MBA and EMBA students indicate that a systems analysis method for business professionals must be much more prescriptive than soft systems methodology Checkland, While not a straitjacket, it must be at least somewhat procedural and must provide vocabulary and analysis concepts while at the same time encouraging the user to perform the analysis at whatever level of detail is appropriate for the task at hand. The latest version of the work system method is organized around a general problem-solving outline that includes: Identify the problem or opportunity Identify the work system that has that problem or opportunity plus relevant constraints and other considerations Use the work system framework to summarize the work system Gather relevant data. Analyze using design characteristics, measures of performance, and work system principles. Identify possibilities for improvement. Decide what to recommend Justify the recommendation using relevant metrics and work system principles. In contrast to systems analysis and design methods for IT professionals who need to produce a rigorous, totally consistent definition of a computerized system, the work system method:

Chapter 6 : Buildings - Project Requirements

Work System Design deals with the systematic examination of the methods of doing work with an aim of finding the means of effective and efficient use of resources and setting up of standards of performance for the work being carried out.

Activities include, but are not limited to: If it is a large system involving many different departments, maintenance and support may be needed for a longer time. If is a smaller system, maintenance and support may only be needed for a short time. Systems Development Methods[edit] This section discusses the most popular methods for developing computer-based information systems. A popular, traditional method is called structured analysis, but a newer strategy called object-oriented analysis and design also is used widely. Each method offers many variations. Some organizations develop their own approaches or adopt methods offered by software vendors or consultants. Most IT experts agree that no single, best system development strategy exists. Instead, a systems analyst should understand the alternative methods and their strengths and weaknesses. Structured Analysis Structured analysis is a traditional systems development technique that is time-tested and easy to understand. Because it describes the processes that transform data into useful information, structured analysis is called a process-centered technique. In addition to modeling the processes, structured analysis includes data organization and structure, relational database design, and user interface issues. Structured analysis uses a series of phases, called the systems development life cycle SDLC to plan, analyze, design, implement, and support an information system. Structured analysis relies on a set of process models that graphically describe a system. Process modeling identifies the data flowing into a process, the business rules that transform the data, and the resulting output data flow. Basically, the structured analysis technique requires that the developer defines three things: In order to see how all these functions work together, the data flow diagram DFD is needed to show the inputs, processes storage, and outputs. Object-oriented analysis defines the different types of objects that are doing the work and interacting with one another in the system and by showing user interactions, called use cases, are required to complete tasks. Systems analysts use O-O methods to model real-world business processes and operations. The result is a set of software objects that represent actual people, things, transactions, and events. Using an O-O programming language, a programmer then transforms the objects into reusable code and components. O-O analysis uses object models to represent data, behavior, and by what means objects affect other objects, By describing the objects data and methods processes needed to support a business operation, a system developer can design reusable components that allow faster system implementation and decreased development cost. The object-oriented approach has many benefits, they provide naturalness and reuse. The approach is natural because people tend to think about things in terms of tangible objects and because many systems within an organization uses the same objects i. Other Development Strategies In addition to structured analysis and O-O methods, there are other systems development techniques created by individual companies. Using MSF, you design a series of models, including a risk management model, a team model, model has a specific purpose and outputs that contribute to the overall design of the system. Although the Microsoft process differs from the SDLC phase-oriented approach, MSF developers do the same kind of planning,ask the same kinds of fct-finding questions,deal with the same kinds of design and implementation issues, and resolve the same kinds of problems. MSF uses O-Oanalysis and design concepts, but also examines a broader business and organizational context that surrounds the development of an information system [9]. Ad Hoc[edit] Ad hoc, is something that one can use to do a specific task but the process that was used cannot be used for another process. The whole project cannot run at that level. One can use a template to create a project but with Ad Hoc, it is not possible. As whole the term "Ad hoc" means for this purpose only. Often considered the classic approach to the systems development life cycle, the waterfall model mostly predictive describes a development method that is linear and sequential. Waterfall development has distinct goals for each phase of development. Once a phase of development is completed, the development proceeds drops over the waterfall into the next phase and there is no turning back. The advantage of waterfall development is that it allows for

departmentalization and managerial control. A schedule can be set with deadlines for each stage of development and a product can proceed through the development process like a car in a carwash, and theoretically, be delivered on time. Development moves from concept, through design, implementation, testing, installation, troubleshooting, and ends up at operation and maintenance. Each phase of development proceeds in strict order, without any overlapping or iterative steps. The disadvantage of waterfall development is that it does not allow for much reflection or revision. Once an application is in the testing stage, it is very difficult to go back and change something that was not well-thought out in the concept stage. This pure waterfall model makes it very difficult because there is no room for error and that is virtually impossible when dealing with humans. In the modification waterfall model, phases of projects will overlap influencing and depending on each other. For instance, if the analysis phase is completed and the project moves into the design phase but something was left out in the requirements in the analysis phase making it hard to implement in the design phase then additional project management tasks need to be added causing an overlap. Efficiency is another reason why overlapping might occur. Some activities depend on the results of prior work. In the project planning phase, there might be some additional project management tasks that need to be added, in the analysis phase, additional analysis activities may be added, and in the design phase, additional design activities may be added. Basically, the modified waterfall model is a more efficient model to use. Today, many information systems and projects are based on the modified waterfall model. In terms of an information system, prototypes are employed to help system designers build an information system that is intuitive and easy to manipulate for end users. Prototyping is an iterative process that is part of the analysis phase of the systems development life cycle. Sometimes, end users are trying to improve on the business processes or simplify a procedure. Prototyping comes in many forms - from low tech sketches or paper screens Pictive from which users and developers can paste controls and objects, to high tech operational systems using CASE computer-aided software engineering or fourth generation languages and everywhere in between. Advantages of prototyping include; Reduction of developments time and cost User involvement.

Chapter 7 : Management Theory Review: Job Design and Work Measurement - Review Notes

Introduction to System Analysis and Design:: 5 (d) System Analysis Systems analysis is a process of collecting factual data, understand the processes involved, identifying problems and recommending fea-.

Chapter 8 : The Learning Toolbox - Cornell Notes

*Chapter 7 - Design of work systems Work systems involves: Job design (content and methods), determination of working conditions, work measurement (establishment of standard times), and compensation Job Design: specifying the content (what) and method (how) of a job *Objective of job design is to increase long-term productivity Job Design contains two important schools of thought 1.*

Chapter 9 : Detailed System Design

Models and methods of work system design need to be developed and implemented to advance research in and design for patient safety. In this paper we describe how the Systems Engineering Initiative for Patient Safety (SEIPS) model of work system and patient safety, which provides a framework for.