

# Design a Curriculum Based on Competency Profiling for Quality Services

P. S. Revankar<sup>1</sup>, K. P. Chaudhari<sup>2</sup>, R.B. Patil<sup>3</sup>

<sup>1</sup>Academic Registrar, G.E.C. Aurangabad, Maharashtra, India.

<sup>2</sup>Lecturer, M.A.E.Pune, Maharashtra, India.

<sup>3</sup>Lecturer, H.I.T. Aurangabad, Maharashtra, India.

## Abstract

*Designing curriculum using Competency profiling is also known as DACUM. This web application is developed to design a teaching material using competency profiling in the form of duties and tasks. It can be achieved by taking experienced persons from industry that has great knowledge about the field/occupation. These steps lead to successful employment of student.*

*This web base application will not just support curriculum development also support for various types of feed back from students. This system will utilize the expert faculty knowledge about specific occupation this is achieved with the interaction of institutional faculties and industry experts. They are taking decision on the base of occupational analysis. Occupational analysis provides analysis of required occupation for the specific time and area.*

*The storyboarding process is one of a number of processes that utilize the concept of display thinking that recognizes that people working in groups can achieve more when they can see the thoughts and ideas that they generate. This is the main function which we have to make online application.*

*The goal of this application is to implement and advance a Curriculum designing process for educational institutes. By using this software every stakeholder will contribute to finding Occupational analysis of organization by providing online feedback. In this online application all steps of DACUM planning is implemented and keep the track of each step. For this we have developed four algorithms for five type of user, Administrator, Facilitator, Faculty, Student and Guest. Online DACUM process improves quality of educational system. The quest for quality is an ongoing process. The goal of this project is to develop skilled Human resources for the Nation. And hence it helps to Integrating the competency framework within the HR system of an organization.*

## I. Introduction

We are developing this system for developing curriculum on the internet network i.e. peer to peer social network to improve quality of system. With the help of this system application, we can store the designed curriculum by various user institution and industry interaction. Designing curriculum is not just responsibility of institute it also supported by industry, for whom, curriculum is designed.

This web base application not just support curriculum development also support for various types of feed back from students. This system utilizing the expert faculty knowledge about specific occupation. This is achieved with the interaction of institutional faculties and industry experts. They are taking decision on the base of occupational analysis. Occupational analysis provides analysis of required occupation for the specific time and area.

In the DACUM process the participants define and describe the job through the use of storyboards. The process begins with the identification of 6 to 8 veteran workers who will serve on a DACUM panel. Individuals who have worked for two or more years on the job and are identified as quality staff members are referred to as high performing incumbent workers.

The DACUM process includes the use of focus groups of veteran workers who participate in a storyboarding process based on a process developed by the Disney Corporation. The storyboarding process is one of a number of processes that utilize the concept of display thinking that recognizes that people working in groups can achieve more when they can see the thoughts and ideas that they generate. The process recognizes that the best source of initial information on a job is veteran workers. The process leads to five basic results: duties, tasks, knowledge, skills and safety.

There are also research approaches to job analysis that involve the development of paper and pencil surveys of workers and managers. The data collected from DACUM panels can provide the basis for the development of research tools.

This process provides useable data in a timely fashion and it provides a positive learning experience for the workers who serve on the panels. The DACUM process doesn't tell the worker what they do, but rather asks them through a series of structured questions and activities to describe their job. A panel of expert workers begins the process by developing a job title and definition. The facilitator then helps the workers place their job in the organizational structure.

The panel then identifies duties (generally 5 to 12 major job areas). The job tasks associated with each duty are then identified. Once the job profile is complete subsequent panels are asked to validate the job profiles. The validated job profile is then shared with a panel of managers to gain their input. Once the job analysis is complete a job task analysis can be conducted. This activity we are achieving with the help of web base application by providing online story board for task And Duty.

The task analysis identifies the sub tasks associated with each task. The workers are asked to identify the major segments of their jobs (duties). For a manager a typical duty might be to Provide Staff Supervision.

After a specific duty is identified the set of tasks that are required to complete this component of the job are then compiled by the panelists. A task is identified as a work activity that has a definite beginning and ending, is observable, consist of two or more definite steps, and leads to a product, service, or decision. For example if a duty associated with a particular occupation was maintain the automobile then some of the tasks included in the completion of that duty could include: wash the car exterior, vacuum car interior and so on.

The panelists would be encouraged by the facilitator and aided by the recorders to phrase the duty and task cards in behavioral (measurable terms). The model DACUM duty or task statement would include a verb, modifier and a noun. A duty or task card for a trainer or manager might look like this: Implement (verb) Training (modifier) Program (noun). This “verb modifier noun” format is used to provide consistency in the job profile and to provide the foundation for the development of performance objectives, a common element of most training and evaluation processes.

The draft job profile is then reviewed and edited by the panelists. The process concludes with a series of prioritizing exercises that allow workers to identify crucial and frequently performed task, as well as those where significant training needs exist. The panelists are asked to evaluate the DACUM process and are issued training certificates. This process not only yields a valuable set of data about the job, but also provides the participants with a rich training experience where they learn more about their perceptions of the job, how others view the work and how the various components of the occupation fit together.

## II. Necessity

Each of the curriculum development models emphasizes the importance of needs analysis, specification of goals and learning objectives, curriculum design based on needs analysis and goals, development of appropriate instructional strategies, formative and summative evaluation, and improvement of the curriculum based on evaluation evidence. Each of the components of the curriculum development process should be reflected in the curriculum materials. Based on the models cited and the DACUM focus on technician training, the checklist below illustrates the necessary components for the development, implementation, and improvement of effective, high-quality educational (curriculum) materials. For the development of high-quality materials to support the curriculum development process [2], materials should:

1. Reflect the results of a formal needs analysis
2. Be industry verified

3. Reflect learning goals and objectives
4. Be developed/adapted as a part of a systematic curriculum development process
5. Support and identify instructional strategies including pedagogy and assessment
6. Be pilot and field-tested
7. Be continuously evaluated
8. Be revised based on evaluation evidence

## III. Objective

Learners know exactly what they must learn and the criteria that will be used to evaluate them. They know that the program content (skills that they learn) are relevant and current for their chosen occupation.

Instructors/Administrators should Provides framework for curriculum development. Provides flexibility (can adapt curriculum to local/regional needs). He provides assurances that program objectives are relevant to industry's needs. He provides a curriculum that can be easily updated/modified. They are assured that graduates receive a current standardized training.

## IV. Literature Survey

The process was begun in Canada in the 1960's by technical college faculty who were attempting to develop training curricula for business and industry. The process has been enhanced over the years and is now considered one of the most popular small group methods of occupational analysis.

WIDS [12] is more than software. They have a 10-person team with over 158 years combined experience in instructional design and consulting. WIDS facilitation services have been used since 1994 by the Wisconsin Technical College System, the Kansas Board of Regents, National Endowment for Financial Education, and Army Junior ROTC to name a few.

Results Based Management (RBM) [3] is a participatory and team-based approach to management that seeks to focus an organization's or project's efforts on the achievement of results. In RBM, projects must be designed, planned and implemented using a participatory approach where all stakeholders are involved throughout the project life-cycle. Expected results must be mutually defined and agreed upon through a consensus building process involving all major stakeholders. This enhances stakeholders' sense of ownership and subsequent commitment to continuous performance assessment, annual performance appraisal, project adjustments and annual work planning.

The ATE guidelines encourage proposals that will produce educational materials that can be used beyond the grantee institution. Proposals are also encouraged that adapt and implement “high-quality” educational materials that have been developed by previously funded projects.

In the program description for those projects that have indicated that materials development was a focus, the following guidelines are given: Proposed activities should affect the learning environment, course content, and experience of instruction for students preparing to be science and engineering technicians.

An analysis of the ATE 1994-2001 proposal guidelines was done to determine whether or not the guidelines had changed over time with regard to the emphasis on materials development and the review criteria for proposals. It was found that the guidelines related to materials development were unchanged from 1994-1996.

This change reflects a shift from encouraging projects to requiring projects to produce materials for use beyond the local setting. The 2000 guidelines omitted the above wording and were changed to reflect the longevity of the DACUM program and the need to encourage others to adapt and implement “high-quality materials” that had already been developed under the DACUM and other programs.

Educational materials are the primary media by which curriculum is documented and disseminated. A discussion of curriculum is essential to understand the materials development process. What defines curriculum is not easily answered. Henson cites 13 different definitions of what comprises the concept of “curriculum.” All of the definitions reviewed have in common the fact that each reflects values and beliefs about the focus of the educational process and the needs being served.

Oliva’s curriculum model was chosen because it is comprehensive and often cited by experts. This model is compared to the “Systematic Curriculum and Instructional Development (SCID) model. The SCID model was developed to incorporate the critical tasks needed to develop competency-based education (CBE) curriculum and instructional materials for workforce training. The SCID model is the basis for the DACUM (Developing A Curriculum) process that has been utilized in several of the DACUM projects to analyze job or occupational skills needed for expert workers. The general model and the SCID model are compared. This identifies the common elements essential to the curriculum development process that can inform the development of a framework for the analysis of the materials development objective of the DACUM program.

The purpose of the SCID model is more focused on workforce training and includes more detailed steps, whereas the Olivia model has fewer steps that encompass more than one step in the SCID model. The only significant element that was not comparable in the two models was that the Olivia model contains the need for an explicit statement concerning the aims and philosophy of education.

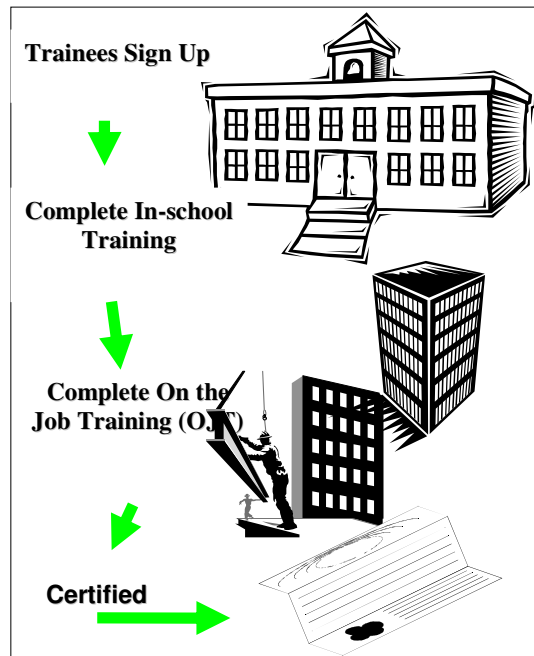


Figure 1.1: Delivery Model

DACUM Procedural Steps [5]

Orientation of committee & Responsibilities: The primary purpose of this committee will be to plan, oversee the implementation of, and evaluate the several orientation sessions

Review of occupation

Identify general areas of responsibility (duties) within the general area of distributed object systems design, there are many. It may identify, for example, intellectual content, a particular presentation. It is solely the responsibility of a name issuing authority

Identify specific tasks performed higher-level user tasks. The algorithm uses text contained in interface windows as evidence of the user performed tasks; we recorded eye movement data using a more on specific areas of the screen compared to easier tasks.

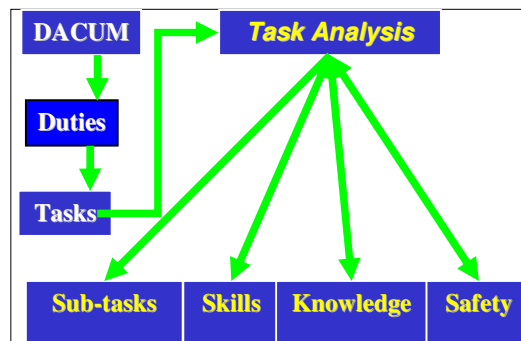


Figure 1.2: Competency profiling

Operational Guidelines

Everyone participates equally and share ideas freely. Provide constructive suggestions rather than

negative criticisms. All task statements are carefully considered all task statements must begin with an action verb and reflect an observable performance. Key Terms are

Duties : an arbitrary grouping or related tasks and usually 8-12 per job

Tasks : specific observable units of work and usually 6-30 per duty and 50-200 per job

Steps : specific elements or activities and required to perform a task and at least two or More per task

Job Tasks have a definite beginning and ending point. It can be performed over a short period of time. It can be performed independent of other work. It Consist of two or more steps. It can be observed and measured. It Result in a product, service, or decision

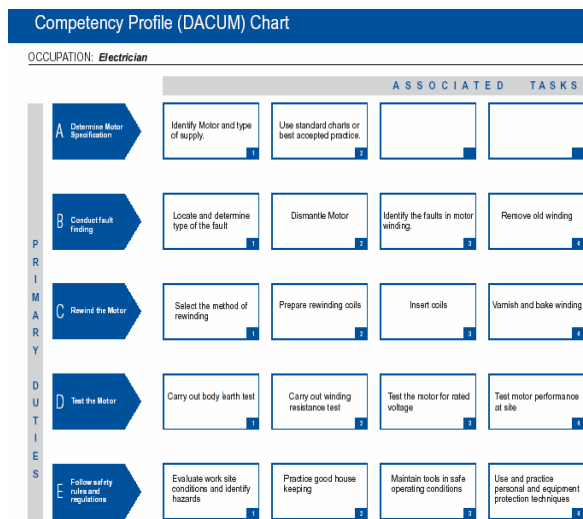


Figure 1.3: Graphic Representation of Job, Duty, and Task Relationships

## V. DACUM Implementation

Functionality design: In this phase the functionality necessary to implement DACUM is explain in detail. Login Form is use to access the online software with specific rights given to specific user. Users are

1) Admin user is having rights to create a profile of particular institute that wants to design a DACUM. It also having authority to create a facilitator, faculty of Institute. The master entry like Designation, branch can be done by using this user.

2) Facilitator user is a main user who having following rights for designing a DACUM plan.

Confirm student: It is use to confirm or reject the student which are enrolling for a program against particular institute.

New faculty creation: This form is use to create a new faculty user. The Necessary information related to faculty is being posted along with unique user Name and password. This user name password is available to make an login for that new user to access this software process.

New Industry type: This form is use to create a new industry user. The Necessary information related to industry is being posted along with unique user Name and password. This user name password is available to make an login for that new user to access this software process.

New Post: create a new post/designation as a master entry for particular institute to which facilitator belongs.

Occupational Analysis: This form is used for showing occupational requirement in market and to help for taking decision over developing new program.

Program registration: This form is used to create new program and note discussion to create DACUM chart.

Competency Profiling: This form is used to finalize duty and task a set priority. By using this we can make proper documentation of curriculum.

Task Assignment: This form is used to take subtask related main task and duty.

Task Analysis: this is a report view task and duties along with subtask

Resource Requirement: this form is used to take other required supporting list to execute the program

Program Announcement: This form used to announce program for multiple batches. It is also useful to make batch of student with the help of student confirmation window.

Question entry: This form is use to enter a question and respective answer choices that can be yes/no Or Multiple choice or descriptive type. These questions are act as feedback question.

Question Bank Posting: This form is use to select a number of question for a particular user as question bank set. This question set is being allotted to particular user by selecting a particular stakeholder.

Question analysis: This form is use to analysis an feedback submitted by all user of particular institute. This feedback contains number of question of particular user, their total number of responses and responses to particular answer

Notice: This form is used for sending notice to particular user from selected program, course, and type of stakeholder.

Program List: This is a report to get program list form database.

Student List: This is a report to get student list form database.

Program Schedule: This is list of program which get announced from program announcement form.

Curriculum: This is report of all documents and a syllabus copy for student.

3) Faculty user is having very similar rights as admin for designing a DACUM plan process. But he is not able to create log in for new institute.

4) Student and alumni user is having following rights for designing a DACUM  
 Enroll Course, Industry Allocation, Syllabus Application of Certificate, Notice:  
 Feedback form: This form is use to provide a feedback against question bank available for student and alumni stakeholder.

## VI. Implementing and Mapping Competencies at organization

We are using social network to discuss duty and Task associated with particular occupation. We have local network as well global for finding out occupational analysis. Hence educational institute able to design curriculum based on competency profile locally with local as well global industry needs.

Profit based organization are able to map these competencies and they can implement it within the organization. HR can use this application to improve the productivity of person by taking face to face questions answering session based on competency profile. HR is going to check first the duties of that occupation and compare with the abilities of the resource person. If he found resource is not aware of all duty and task of that job/Occupation, he can arrange training at educational institute by designing curriculum for organizational resources to improve productivity.

The organization can open assessment center which is going to map the productivity of employee based on his experience on listed duties and task in specified curriculum. These curriculums are available on this web application; which gives the direction to assessment center of origination to improve the quality of services and quality of experience.

### Coding

With the help of coding we have design above algorithms.

To design this online software following Microsoft based technologies are used:

1. Microsoft Visual studio .NET 2005 for designing front end windows.
2. Relational Database- SQL Server 2005 as a Backend for designing a Database which includes various Database Tables and Store Procedure to store the important online information submitted by stakeholders.

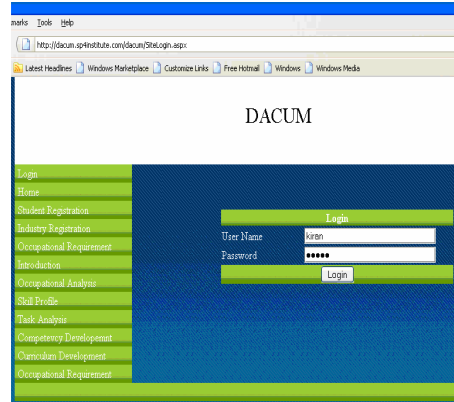
### Testing

Above code is tested and validated online. These programs implement the DACUM process successfully. For this we have tested application GUI and Security.

## Implementation on Web

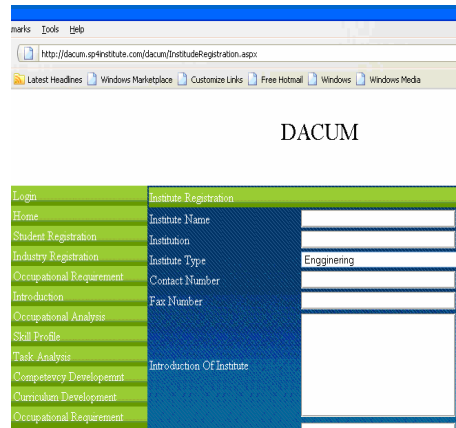
Application is loaded on the internet Under the banner of [www.dacum.sp4institute.com](http://www.dacum.sp4institute.com). User interface flow is been used here for each application so as to visualize how the application flows from one page to the next. This is the welcome screen that appears right at the beginning of the project when it is run.

Screen 1.1: Welcome Screen



A user can login as Administrator, facilitator, faculty, student and guest. If a person does not have a login name and password, he should request the administrator, whoever so, to give him/her the username and password through a systematic way of registration.

Screen 1.2: Administrator Area



## Application

This software is applicable to all technical educational institutes. It is also available for those institute which conduct small training program for industry as per requirement. By using this concept all institutes can conduct DACUM program to help nation to generate employable workforce and generate revenue. It works on internet so that any common stakeholder can access this software to register and post their feedback regarding institute and program. It is also useful to industry person, especially for HR. He is able to find right resources for right job very easily with the help of Competency profile of that person.

## VII. Conclusions

A training package describes the skill and knowledge needed to perform effectively in the workplace. Teacher and trainers develop learning strategies, the “how” depending on learners needs, abilities and circumstances. Outcome of this application is student should get proper training guidance, curriculum and on job training.

This software is easily accessible to faculty, student, alumni, guest, and facilitator of institute any time any where. This will help to get a feedback in a limited time span from all stakeholders. Based on this occupational analysis, facilitator is able to find out probable required program, to creating new man force to work. The data we get through occupational requirements.

Facilitator develops program/course for student very easily with industry expert by using competency chart of duty and task. By developing proper curriculum and registering student by allocating industries, user can view or take print of report as complete information of that program for student/faculty.

Future Scope of this software is useful for all educational institutes which can draft their own DACUM. Our next aim is to implement it in regional languages so that common stakeholder can easily

accessible to it in their mother tong. We also plan to implement it for profit based organizations. It helps to integrating the competency framework within the HR system of an organization. It can be used to Implementing and mapping competencies in an assessment centre. It used for reviewing the plethora of application-based experiences and existing models also for effectively managing the consequent changes in the organization.

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