

Digital Allowance Estimation Technique

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Abstract: Generally the miscellaneous allowances or remuneration of the employees of an organisation are calculated manually. Particularly the remuneration of a faculty of an institute concerning examination is calculated manually. Sometimes the faculty has to fill-up a form to write distinct required information. This work is seemed cumbersome. It is a complex process and takes time. It bears scope of numerous errors. In this perspective, this research work aims to develop a digital system. It will take less time. It is very easier in estimating the allowances. The obtained result is accurate. The faculty or employee of an institute or organization can use this digital system in order to enumeration their remuneration related with examination. It is very effective process. Huge number of individuals as well as organization will be benefited using this digital system. This digital system is developed for desktop application (windows) and web based application. As a desktop application user can use this system without internet. As a web based application user must need internet. The desktop application is being developed using Dot net framework using C# programming language and the web based application is being developed using PHP, JavaScript, HTML, JQuery and CSS and DBMS like MySQL, Bootstrap, Laravel Framework.

Keywords : Allowance, Digital technique, HTML, PHP

I. INTRODUCTION

Employee allowances are such benefits known as workplace bonuses because the workers get paid extra money for things that are not part of their regular salaries. We can use two types of methods to determine the allowances of the employer. These are manual methods and computerized methods. The manual method is a complex process and the possibility of a mistake in accounting. An experienced person

is required for accounting. Some problem of the manual systems are given below

Time Consuming: Manual calculation process take exceeding time to calculation remuneration or allowance of employees.

Trouble in Rewriting: In traditional process, there is no edit option. If any error is happened, there is no way to rewrite calculation.

Difficulty in calculation: Employees have numerous allowance factors. The calculation of those factors is difficult when using manual calculation.

Error Probability: It is difficult to provide accuracy for mountainous calculation by manual process.

Analog System: In present era, everything is converting as digital system. The calculation of remuneration or allowance is still analog.

On the other hand computerized method is more usable than manual method. In here different related computerized works are described in short.

i) Work: Check the teacher's salary against the 2017-18 pay scales with this calculator [1].

A UK teacher's salary will most likely be influenced by the national teachers' pay scale. Although not all schools are legally obliged to implement the pay scales, many still use them to guide their own pay structure. One can check their current salary using this pay scale calculator. There are different pay scales on above of the pay level for unqualified or qualified teachers. One's pay will also depend on whether you're employed in central London, outside London, in the fringe area of London, or elsewhere in England or Wales.

ii) Work: Estimate Annual Allowance [2].

One can use this system to determine if he/she may be affected by an annual allowance fee and have to file tax return up to and also including 2014 to 2015 for tax years.

iii) Work: NWS Benefits Calculator [3].

Some personal information must be entered in the tech.NSW value calculator. Does not maintain or monitor this material. The calculator provided results are descriptive only.

iv) Work: Maryland State Retirement and Pension System [4].

The State Retirement and Pension System of Maryland, the State Retirement Agency and the Board of Trustees ("Program") do not keep records of the estimates provided by this estimator. The output of this estimator is based on information given by us only, and does not include any information contained in System records. The results the estimator provides are not intended to constitute a contractual statement on the system.

Our proposed Digital allowance Estimation technique is a computerized system, which calculates employee allowance automatically. The proposed system is useful for any kind of Institute or Business Company to estimate their employee allowance in a suitable manner and accurately.

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The proposed system is developed for desktop application and web application. So the user can use this system over the internet and without internet.

II. METHODOLOGY

2.1 Software Development model

We have employed Software Development Life Cycle (SDLC) for our work. SDLC is a mechanism consisting of a set of planned activities for the development or alteration of the Software products. There are many styles of software development within the SDLC. We choose the pattern which is known as Agile Model.

2.2 Data Flow Diagram

Some of the main data flow diagrams are given below which we have used in our work.

2.2.1 Basic Diagram:

This diagram reflects overall view of our proposed system. Fig.1 shows the basic diagram.

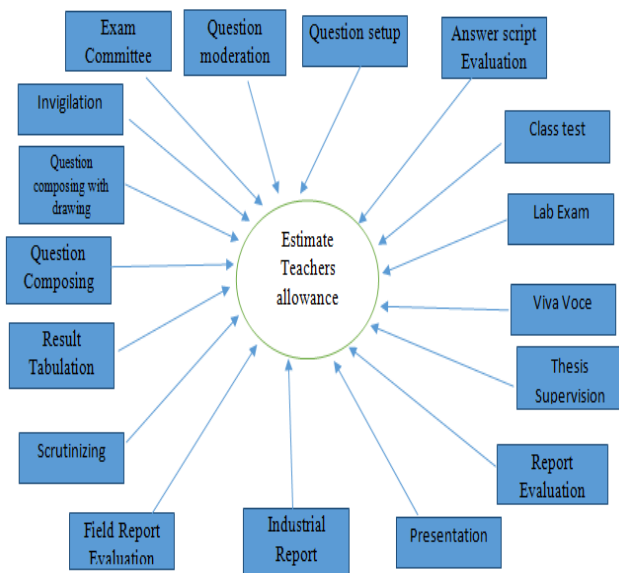


Fig.1. Basic diagram

2.2.2 Flowchart

The flowchart for our work is shown in Fig.2.

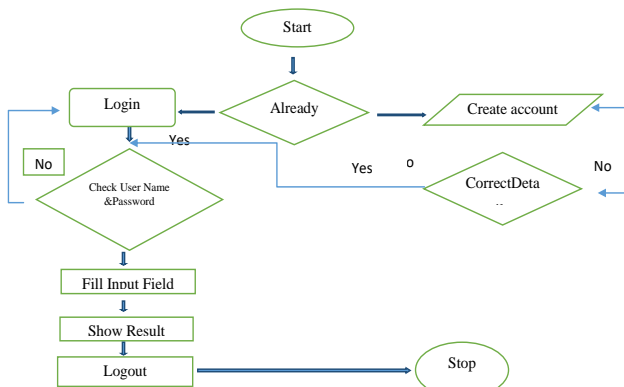


Fig.2. Flow chart

2.2.3 Database Table

A database is composed of several elements, the most important of which is the table. The database table is where all the data is stored in a database, and there wouldn't be much use for relational databases without tables. A database is composed of one table or more. Each table consists of columns and rows. If we think of a table as a grid, the column goes across the grid from left to right, and each data entry is identified as a row. In our work we need six table that shown in Fig.3.

billsheet_users	billsheet_roles	billsheet_password_resets
id : int(10) unsigned	id : int(10) unsigned	email : varchar(191)
role_id : int(11)	name : varchar(191)	token : varchar(191)
name : varchar(191)	slug : varchar(191)	created_at : timestamp
email : varchar(191)	created_at : timestamp	updated_at : timestamp
password : varchar(191)		
contact_no : varchar(191)		
image : varchar(191)		
remember_token : varchar(100)		
created_at : timestamp		
updated_at : timestamp		

billsheet_departments	billsheet_subjects	billsheet_rates
id : int(10) unsigned	id : int(10) unsigned	id : int(10) unsigned
name : varchar(191)	course_code : varchar(191)	exam_committee_chairman : varchar(191)
head : varchar(191)	name : varchar(191)	exam_committee_member : varchar(191)
email : varchar(191)	credit : varchar(191)	question_moderation : varchar(191)
contact_no : varchar(191)	year : varchar(191)	question_setup_one_credit : varchar(191)
created_at : timestamp	term : varchar(191)	question_setup_two_credit : varchar(191)
updated_at : timestamp	department_id : varchar(191)	question_setup_three_credit : varchar(191)
	department_name : varchar(191)	answer_script_evaluation_one_credit : varchar(191)
	image : varchar(191)	answer_script_evaluation_two_credit : varchar(191)
	created_at : timestamp	answer_script_evaluation_three_credit : varchar(191)
	updated_at : timestamp	class_test : varchar(191)
		lab_exam : varchar(191)
		viva_voice : varchar(191)
		thesis_project_supervision : varchar(191)
		thesis_project_report_evaluation : varchar(191)
		thesis_project_presentation : varchar(191)
		industrial_taining : varchar(191)
		field_report_evaluation : varchar(191)
		scrutinizing : varchar(191)
		result_tabulation : varchar(191)
		question_paper_composing : varchar(191)
		question_paper_composing_drawing : varchar(191)
		chief_invigilator : varchar(191)
		invigilator : varchar(191)
		created_at : timestamp
		updated_at : timestamp

Fig.3. Database table

2.2.4 DFD 0-Level Diagram

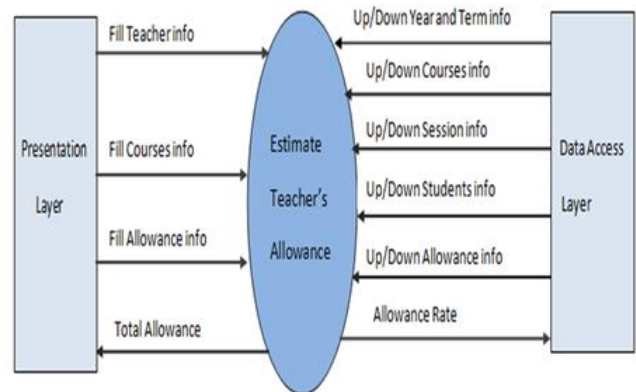


Fig.4. DFD 0-level diagram

A data flow diagram (DFD) is graphical representation of data that flow through an information system, representing the process aspects thereof. A DFD is often used as a first step to build a system summary without going into much depth which can be expanded later on. DFDs can also be utilized for data processing visualization. We show the DFD 0-Level Diagram for our work in Fig.4.

2.3 Testing

It includes in-application error detection. The testing process begins with a test plan that recognizes test-related activities such as the generation of test cases, test criteria and the allocation of resources for testing. The code is tested against the design document created during the design phase and mapped against. The test phase output is a test report that contains errors that occurred while testing the application. The primary purpose of the testing is to determine the compliance of the program with the stated needs. The Unit Testing, Implementation Testing, Program Testing and Acceptance Testing are four main test stages.

Using integration testing technique we tested our program. The different units of the system are incorporated in integration testing to shape the complete system and this kind

of monitoring inspects the device as a whole to ensure it does what it is meant to do. The integrated system testing may be performed top-down, bottom-up, or big bang. Some parts will be tested using white box testing in this type of testing, and some with black box testing techniques. This type of testing plays a very important part in increasing the productivity of the systems.

2.4 Technologies

Software technology is a dictionary of Computing. Software technology is a general term covering the development methods, programming languages, and tools to support them that may be used in the development of software. The following tools are needed to implement our system.

Bill Sheet of Examination's Allowance

Teacher's Information

Name:
 Designation:
 Department:
 Mobile:
 Email:

Examination Information

Department:
 Label: ☐ B.Sc ☐ M.Sc
 Session: 2019 - 2020
 Year: Term:
 No. of Student:
 Conducted Course:

1. Exam Committee

Designation:

2. Question Moderation

(1) (2) (3) (4)
 (5) (6) (7) (8)

3. Question Setup

Sl	Course	Credit
(1)	<input type="text"/>	<input type="text"/>
(2)	<input type="text"/>	<input type="text"/>
(3)	<input type="text"/>	<input type="text"/>
(4)	<input type="text"/>	<input type="text"/>

4. Answer Script Evaluation

Sl	Course	Credit	No. of Scripts
(1)	<input type="text"/>	<input type="text"/>	<input type="text"/>
(2)	<input type="text"/>	<input type="text"/>	<input type="text"/>
(3)	<input type="text"/>	<input type="text"/>	<input type="text"/>
(4)	<input type="text"/>	<input type="text"/>	<input type="text"/>

9. Thesis / Project Report Evaluation

Course:
 No. of Report:

10. Thesis / Project Presentation

Course:
 No. of Student:

11. Industrial Training / Report Evaluation

Course:
 No. of Report:

12. Field Report Evaluation

Course:
 No. of Report:

13. Scrutinizing

Sl	Course	No. of	S	Course	No. of Student
(1)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
(2)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

14. Result Tabulation

Status	No. of Student
<input type="text"/>	<input type="text"/>

17. Invigilation

Sl	Date	Time	Hours	Type
(1)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
(2)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
(3)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
(4)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
(5)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
(6)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
(7)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
(8)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
(9)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
(1)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
(1)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
(1)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Menu

Printer icon:

Scanner icon:

Fig.5. Presentation layer of the digital allowance system

2.4.1 Project Category

Our system is built for both desktop applications and web applications.

- Desktop Application: Users will get all the facilities without internet and all the database information will be stored on its own computer.
- Web Application: A web-based application is any program that uses a website as the front-end or GUI. Users can easily access the application from any computer connected to the Internet using a standard browser. Database information is store in a hosting server.

2.4.2 Development Tools

Desktop Application:

- Development Environment: Windows Machine,
- Design Tools: Adobe Photoshop, Microsoft Paint.
- IDE: Visual Studio 2015
- Programming Language: C#

Web Application:

- Development Environment: Windows, Linux, Smart phone
- Design Tools: Adobe Photoshop, Microsoft Paint.

- Front End: HTML5, CSS3, Twitter Bootstrap-4, JavaScript, JQuery etc.
- Back End: PHP (Laravel 5.4), MySQL
- IDE: Visual Studio Code
- Compatible Browsers: Mozilla 43+, Chrome: 38+, IE 50+

2.4.3 Server Requirements

Desktop application:

- Operating System: Windows,
- .NET Framework: 4.5 or Above

Web application:

- Operating System: Windows, Linux
- Web Server: Apache/NGINX
- PHP Version: Minimum 5.6
- My SQL version: Minimum 5.0
- RAM: Minimum 4 GB
- Storage: Minimum 10 GB
- Bandwidth: Minimum 5 GB/month

2.5 Work Screenshot

Screenshots of our system is given below-

2.5.1 Presentation Layer

Presentation Layer of our System is shown in Fig.5.

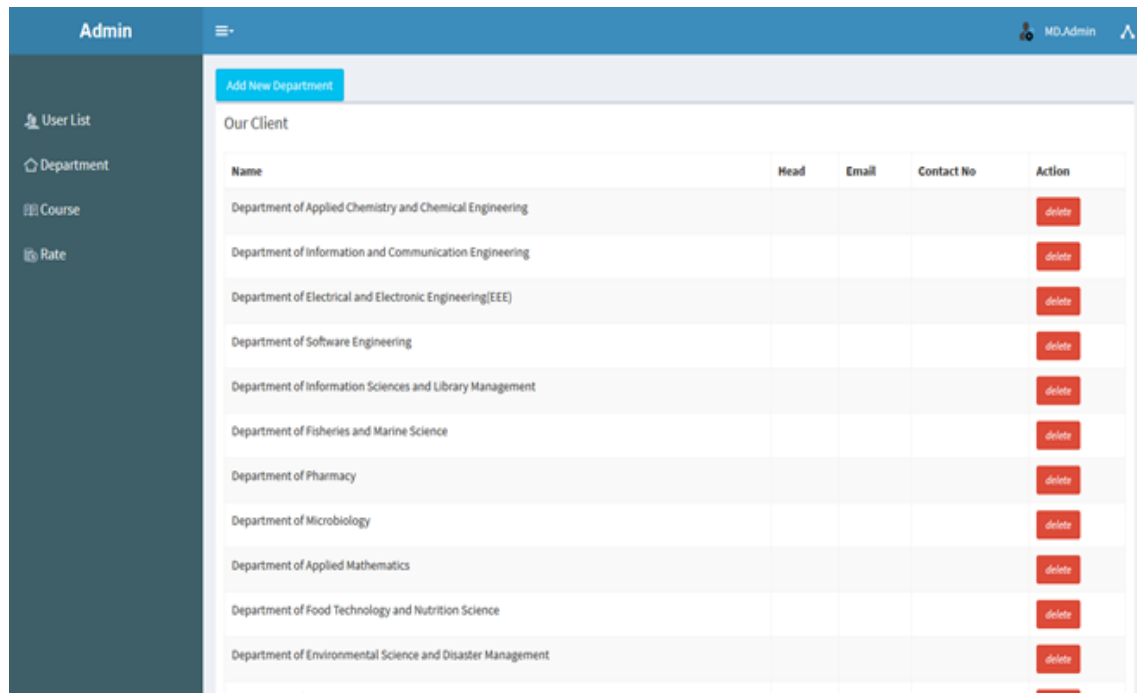
Fig.6. Login page

Fig.7 shows total user list.

Name	Email	Contact No	Image	Action
MD Admin	admin@site.com	0170xxxx		Action
MD User	user@site.com	0170xxxx		Action

Fig.7. Total user list

The list of the departments is shown in Fig.8.

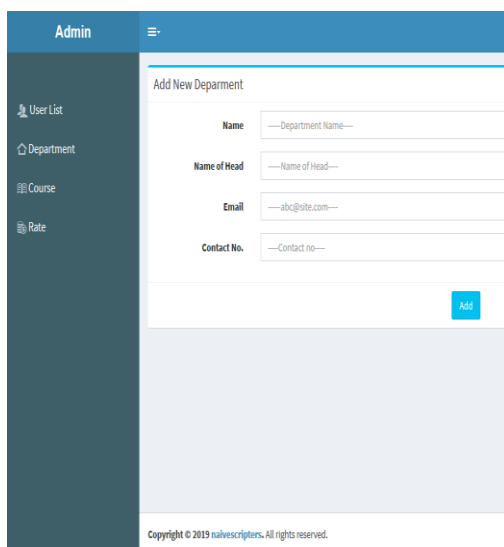


The screenshot shows the Admin panel with a sidebar menu containing 'User List', 'Department', 'Course', and 'Rate'. The main content area has a tab 'Add New Department' and a table titled 'Our Client'.

Name	Head	Email	Contact No	Action
Department of Applied Chemistry and Chemical Engineering				delete
Department of Information and Communication Engineering				delete
Department of Electrical and Electronic Engineering(EEE)				delete
Department of Software Engineering				delete
Department of Information Sciences and Library Management				delete
Department of Fisheries and Marine Science				delete
Department of Pharmacy				delete
Department of Microbiology				delete
Department of Applied Mathematics				delete
Department of Food Technology and Nutrition Science				delete
Department of Environmental Science and Disaster Management				delete

Fig.8. Total department list

Any department can be added according to the Fig.9. And Fig.10 shows course list.

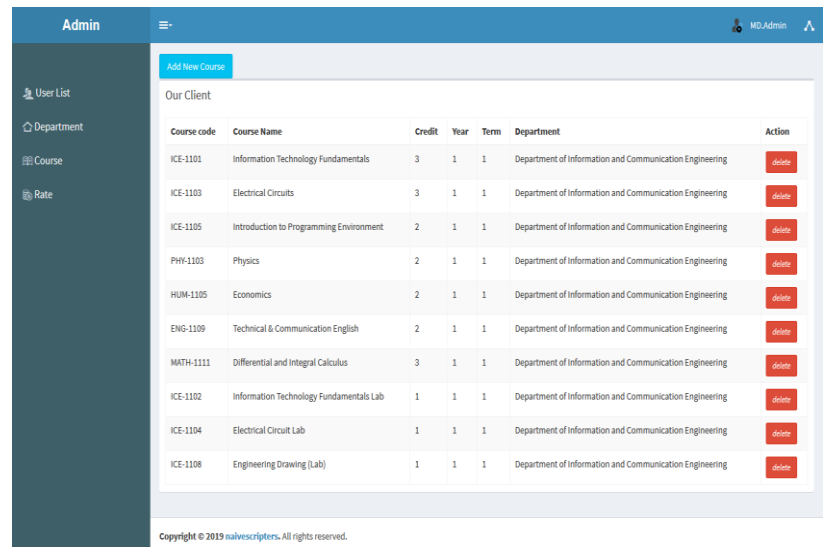


The screenshot shows the 'Add New Department' form with the following fields:

- Name:
- Name of Head:
- Email:
- Contact No.:

There is an 'Add' button at the bottom right of the form.

Fig.9. Add new department



The screenshot shows the Admin panel with a tab 'Add New Course' and a table titled 'Our Client'.

Course code	Course Name	Credit	Year	Term	Department	Action
ICE-1101	Information Technology Fundamentals	3	1	1	Department of Information and Communication Engineering	delete
ICE-1103	Electrical Circuits	3	1	1	Department of Information and Communication Engineering	delete
ICE-1105	Introduction to Programming Environment	2	1	1	Department of Information and Communication Engineering	delete
PHY-1103	Physics	2	1	1	Department of Information and Communication Engineering	delete
HUM-1105	Economics	2	1	1	Department of Information and Communication Engineering	delete
ENG-1109	Technical & Communication English	2	1	1	Department of Information and Communication Engineering	delete
MATH-1111	Differential and Integral Calculus	3	1	1	Department of Information and Communication Engineering	delete
ICE-1102	Information Technology Fundamentals Lab	1	1	1	Department of Information and Communication Engineering	delete
ICE-1104	Electrical Circuit Lab	1	1	1	Department of Information and Communication Engineering	delete
ICE-1108	Engineering Drawing (Lab)	1	1	1	Department of Information and Communication Engineering	delete

Fig.10. Total course list

2.5.2 Admin Layout

Following are the Outlook of admin panel of the website, which we developed.

The Login Page of the website is shown in Fig 6.

New course can be included as Fig.11. According to Fig.12 the rate of various fields can be updated.

III. RESULT AND DISCUSSION

Our developed system provides well-decorated and accurate calculation of employee's remuneration or allowance. The result shows as PDF format that can be easily downloaded and print for further use. Our developed system

shows all types of allowance against employees, allowance rate, and total amount of allowance. The calculation of allowance is converted into PDF format from traditional calculation.

The figure of output format is given Fig. 13-16.

Admin

Add New Course

Course code:

Course Name:

Credit:

Year:

Term:

Department:

Add

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Fig.11. Add new course

Admin

Rate

Exam Committee Chairman: 3000

Exam Committee member: 2500

Question moderation: 2000

Question setup for one credit: 0

Question setup for two credit: 1350

Question setup for three credit: 1500

Answer Script Evaluation for one credit: 0

Answer Script Evaluation for two credit: 90

Answer Script Evaluation for three credit: 120

Class Test: 40

Lab Exam: 1200

Valva voce: 60

Thesis project supervision: 4000

Thesis project report evaluation: 1500

Thesis project presentation: 150

Industrial training / Report Evaluation: 300

Field report evaluation: 80

Scrutinizing: 20

Result Tabulation: 60

Question paper composing: 150

Question paper composing with drawing: 200

Chief invigilator: 500

Invigilator: 500

Add

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Fig.12: Update the rate of various fields



Noakhali Science and Technology University
Noakhali-3814
Website: www.nstu.edu.bd
Bill Sheet of Examination's Allowance

Teacher's Information :
Name : Teacher name
Designation : Professor
Department : Information and Communication Engineering
Mobile : 018XXXXXXX
Email : abc@example.com

Exam Information :
Department : Information and Communication E
Level : B.Sc
Session : 2014-2015
Year : I Term : II
No. of Student : 42

Course Conducted in this term : ICE-1201, ICE-1205

Sl. no.	Particulars	Course Code	Others	Allowance	
				Rate (TK)	Total (TK)
1.	Exam Committee		Designation		
			Chairman	2500.00	3000.00
2.	Question Moderation	ICE-1201			
		ICE-1205			
				2000.00	2000.00
3.	Question Setup	ICE-1201		1500.00	1500.00
		ICE-1205		1500.00	1500.00
4.	Answer Script Evaluation		No. of Scripts		
		ICE-1201	42	120.00	5040.00
		ICE-1205	42	120.00	5040.00
5.	Class Test	ICE-1201	Test No. No. of Scripts		
			Test-1 42	40.00	1680.00
			Test-2 42	40.00	1680.00
			Test-3 42	40.00	1680.00
		ICE-1205	Test-1 42	40.00	1680.00
			Test-2 42	40.00	1680.00
			Test-3 42	40.00	1680.00

Fig.13. Result sheet one



Noakhali Science and Technology University
Noakhali-3814
Website: www.nstu.edu.bd
Bill Sheet of Examination's Allowance

Sl. no.	Particulars	Course Code	Others	Allowance	
				Rate (TK)	Total (TK)
			Test No. No. of Scripts		
			Test-1		
			Test-2		
			Test-3		
			Test-1		
			Test-2		
			Test-3		
6.	Lab Exam		No. of Day		
		ICE-1202	3	1200.00	3600.00
7.	Valva Voce		No. of Student		
		ICE-1200	42	60.00	2520.00
8.	Thesis / Project Supervision		No. of Student		
9.	Thesis / Project Report Evaluation		No. of Report		
10.	Thesis / Project Presentation		No. of Student		
11.	Industrial Training / Report Evaluation		No. of Report		
12.	Field Report Evaluation		No. of Report		
13.	Scrutinizing		No. of Student		
		HUM-1207	42	20.00	840.00
		MATH-1211	42	20.00	840.00
14.	Result Tabulation		No. of Student		
			42	60.00	2100.00

Fig.14. Result sheet two

Noakhali Science and Technology University

Noakhali-3814

Website: www.nstu.edu.bd

Bill Sheet of Examination's Allowance

Sl. no.	Particulars	Course Code	Others	Allowance	
				Rate (TK)	Total (TK)
15.	Question Paper Composing	ICE-1201		150.00	150.00
		ICE-1205		150.00	150.00
16.	Question Paper Composing with Drawing				
17.	Sevigation	Date	Time	Hour	Type

Total Amount =

38260.00

Fig.15. Result sheet three

<p>Noakhali Science and Technology University Noakhali-3814 Website: www.nstu.edu.bd Bill Sheet of Examination's Allowance</p>			
<p>Signature of Recipient (with seal)</p>		<p>Signature of Chairman Examination Committee (with seal)</p>	
<p>Date :</p>		<p>Year : I Term : II Session : 2014-2015 Department : Information and Communication Engineering</p>	
<p>For Office of Controller of Examination</p>			
<p>Comment : Checked and Recommended for paying the amount.</p>			
<p>Office Assistant (with seal) Section Officer / Assistant Controller of Examination (with seal) Deputy Controller of Examination (with seal) Controller of Examination (with seal)</p>			
<p>For Account Directorate</p>			
<p>Date :</p>			
<p>Comment : After checking the submitted bills Amount (TK) _____</p>			
<p>In words _____ is paid to the applicant.</p>			
<p>Section Officer / Assistant Director (Accounts) (with seal) Deputy Director (with seal) Director (with seal)</p>			

Fig.16. Result sheet four

IV. CONCLUSION

In this work, our developed system named as Digital Allowance Estimation Technique for Employee is mainly implemented for teachers. Our system focuses on the calculation of teacher's allowance for taking examination. We will add feature in our system, where user can edit, save, preview and check their calculation.

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Ishtiaq Ahammad, is a Postgraduate student in the Department of Information and Communication Engineering (ICE), Noakhali Science and Technology University (NSTU), Chattogram, Bangladesh. He is the University Rank Holder (Merit Position: 1st) in Undergraduate level. His Area of interest is Software Defined Networking (SDN), Fog Computing, Internet of Things (IoT), Giga-Scale Integration (GSI). He is a highly spiritual person, tech savvy, with high achievement orientation, dedicated and very accommodative to changes..



Main Uddin, is a lecturer at the Department of Information and Communication Engineering, Noakhali Science and Technology University, Bangladesh. He has obtained the degree B.Sc in Computer Science and Telecommunication Engineering from the same university. Formerly, he would work in Z.H. Sikder University of Science and Technology, Bangladesh as lecturer. His research interest includes Fog Computing, Distributed Network and Network Science.



Tanvir Zaman Khan, is currently working as Assistant Professor in Information and Communication Engineering department in Noakhali Science and Technology University, Noakhali-3814, Bangladesh. His research interest includes antenna design, machine learning, pattern recognition, neural networks, computer networking, VLSI system design, image processing, embedded system design, web security & application, telecommunication and feature selection.