



BK Birla Institute of Engineering & Technology, Pilani (Raj.)

Department of Computer Science and Engineering

Innovations by the Faculty in Teaching and Learning process

1. Bloom's Taxonomy in Teaching:

- Faculty follows the Bloom's Taxonomy for the effective teaching- learning process.
- Faculty prepare the lecture plan and create the content taking in reference the Bloom's taxonomy which helps students understand, remember and analyse the concepts.

2. Teaching through Multimedia Tools:

- Faculty uses lecture theatres equipped with projectors, computers, sound system and internet to present the lectures through videos and animated presentations.
- Faculty shows animated presentations and videos to students to teach them in effective manner.
- Videos and animated presentations are very helpful in interactive learning as they are visually attractive and create interest in students.
- Faculty makes students able to relate theoretical concepts and logics with such tools easily and effectively as it targets the audio-visual sense of students.
- Students experience the modern-days teaching methodology. This process supports Bloom's Taxonomy as it helps students to remember, understand, apply, analyse, evaluate and create.

3. Teaching through demonstration in Laboratories:

- Faculty uses computer simulation software tools in the laboratories to demonstrate the working of real world system on computer. This method effectively demonstrates the abstract concepts, creates interaction between students and simulated equipment, and help students to improve their knowledge and skills.
- Faculty demonstrates the practical using the modern multimedia tools like presentations, videos and animations on projector/ TV screen installed in the laboratories.
- Teaching with interactive demonstration is highly effective in the learning process for students as they visualize the problem with solution and then they can apply the same concept in solving new problem.
- This process highly supports Bloom's Taxonomy as it helps students to understand, remember, analyse, evaluate and create.

4. Research & Development:

- Faculty motivates students in the area of research and development by involving students with them in research work. Problem statements are discussed and collaborative approach for the creation of solutions is followed.
- Faculty guides students in writing research paper, publishing and presenting them.
- Faculty guides students in selecting and implementing research oriented industry based real-time projects.

5. Skill set classes:

- Faculty identifies the skill set to make students industry ready and arranges the skill development classes e.g. IOT (Internet of Learning), Machine learning, CV writing, Presentation skills, communication skills
- Skill set classes are included in the regular classes' timetable for all students.

6. Industrial Visits and Trainings:

- Faculty identifies the learning gap between theoretical learning and practical training and arranges Industrial visits for students to bridge such gap in a real-life environment.
- Students observe, understand and learn the industrial practices and organizational hierarchy during these industrial visits.
- Such Industrial visits for students provide opportunities for active as well as interactive learning experiences outside the classroom in addition to usual classroom learning.

7. Online courses:

- Faculty undergo online courses from the sources like SWAYAM, NPTEL, Coursera, Edx, etc. in their area of interest and motivate students to do the same.
- Online courses help both faculty and student to enrich their knowledge on current trends and also to equip themselves with inter-domain expertise.
- These courses are certified by the National and International universities and are motivating towards lifelong learning.
- Online courses also provide forum for discussion among the experts and students worldwide.

8. e-notes:

- Faculty prepares the e-notes as per the subject syllabus and provide to students through e-mail as well as print copy. E-notes are more easily accessible in Laptop, computer and mobile devices making students to refer and study using notes anywhere and anytime.

9. Innovative assignments:

- Faculty designs the practical assignment problems in relation to the concepts taught in the class, which makes students to understand and explore the problem and create and evaluate its solution.
- Practical assignment helps in developing the imaginative, openness, problem solving and critical thinking ability of the students.

10. Technical presentation:

- Faculty arrange presentation sessions and encourage students to present a technical topic of their area of interest.
- This technique serves as an effective platform for knowledge transfer, overcome stage fear, develop presentation skills, communication skills and build confidence.
- These skills significantly help students in their career growth.

11. Co-curricular and extracurricular activities:

- Co-curricular and extracurricular activities are conducted to motivate the students and to improve personality, problem solving capabilities, build leadership abilities, learn team work ethics, and administering critical situations.
- These activities include Aptitude Training, Social Welfare Camp, Problem solving, Entrepreneurship Development Programs, Critical Thinking, etc.

12. Instant Talks and Group Discussions:

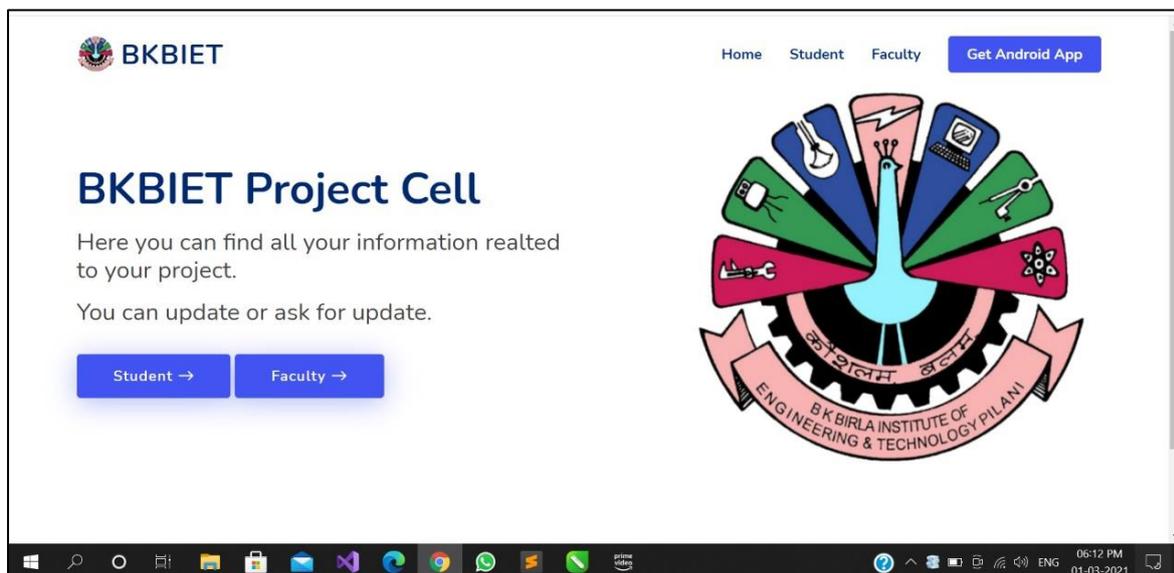
- Faculty arranges instant presentations in the class in which they motivate students to speak on a general topic for 5 minutes. Topic for speech is selected randomly and provided randomly to students.
- Faculty arrange group discussion among a group of students. A topic is provided and each student is asked to participate. Such activity helps students to explore the wide aspect of the topic.
- This activity helps students overcome fear to express themselves among others, build confidence, improve personality and improve skills that also help them in placements.

13. Project Based Learning:

- Faculty undertake the innovative projects based on real life problems for students and encourage as well as guide them in its implementation.
- Such projects often force students to use multiple learning techniques to succeed, which includes research, analysis, and iterative learning.
- These projects are usually done in groups which encourage teamwork ability in students.
- Project Exhibition is conducted in the department every year to enrich the development skills of the students.

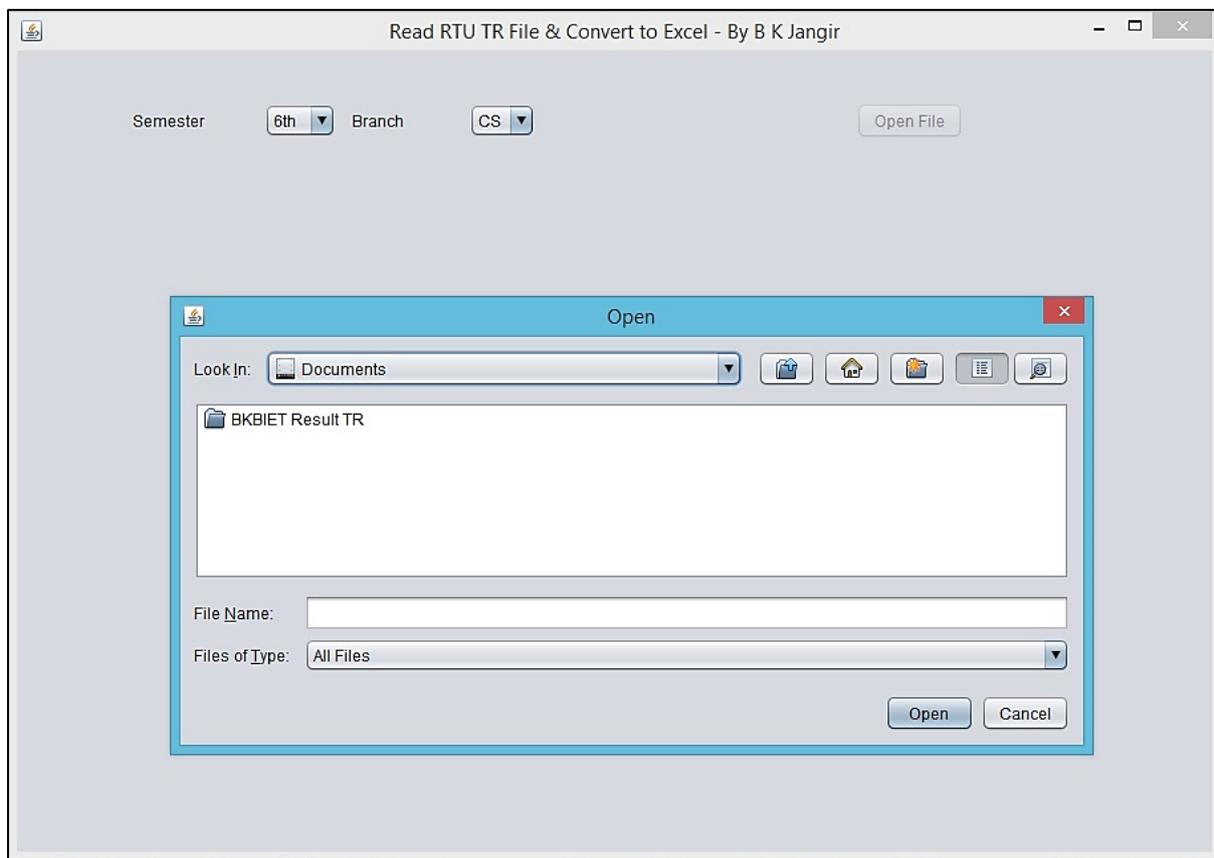
14. Online Project Registration:

Website developed by Mr. Himanshu Verma, Assistant Professor, Project cell CS Department and team for students, where they submit project synopsis (minor and major) online to encourage paperless work. It also makes easier for students to get approval by their project guide for the project work



15. Result TR reader application:

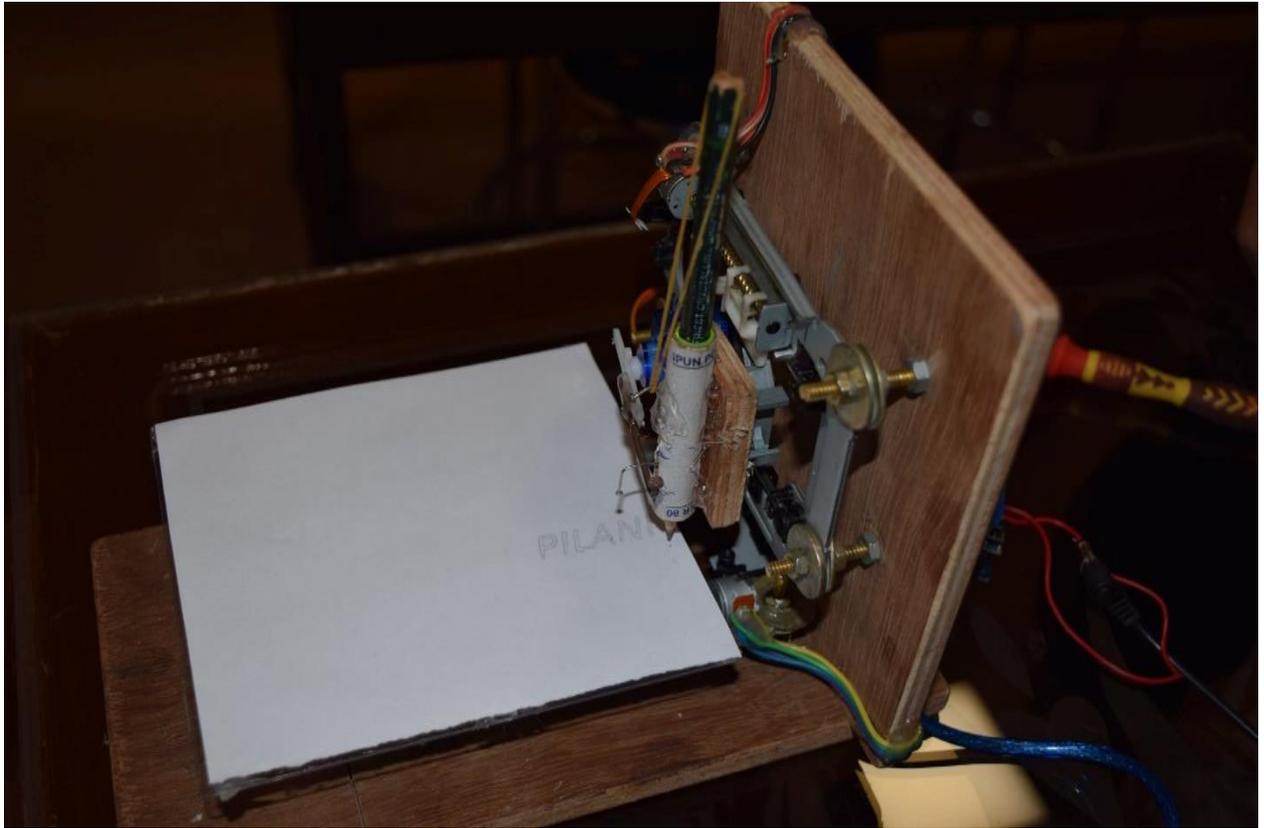
Application developed by Mr. Bhupendra Kumar Jangir, Assistant Professor, CS Department for reading the result TR files. This application is developed in JAVA. It converts the TR files in Excel format which makes it easier for the Institute in better evaluation and analysis of the results declared



16. Collaboration with BIH (Birla Innovation Hub)

The establishment of the Birla Innovation Hub is the place which provides facilities to nurture new ideas and help develop inquisitive perspective in youths of today. These would serve as springboards for new ideas and innovation and thus helping the society and economy to face future challenges and meet rising aspirations of the growing population. Innovation hub is specifically designed for all the Pilani and nearby school & college students, teachers and general public.

Innovation Hub at Birla Science Museum has been established by National Council of Science Museums (NCSM) under the Scheme for Promotion of Innovation, Creativity and Engagement in Science (SPICES) of Ministry of culture, Government of India.



17. BI Analytics Dashboard Implementation for Kesoram Cement Industry Basnatnagar Plant

Our Faculty members Mrs. Ruchi Sharma & Mr. Vipin Saraogi implemented BI analytics Dashboard for Kesoram Cements Basnatnagr Plant.

7.1 BI Dashboard for Logistics

Below analysis can be done:

1. **Transporter Performance Analysis:** Plant, Zone, Branch and packaging level performance analysis of Transporter on different period i.e day, month, year etc. Business users can do performance analysis of particular Transporter or group of transporters across plant, zone, state branch & Product etc.
2. **Order Execution Analysis:** Zone wise Analysis is provided which gives the insight on orders (No of orders & volume) execution in the bucket of *less than 24 hrs, between 24 hrs to 48 hrs and greater than 48 hrs*. Business Users can do orders analysis across plant, zone, state, branch Customer & Product etc.
3. **Godown Wise Inventory Analysis:** Product wise Inventory replenishment analysis is provided for different Godown. Business users can analyze inventory of products and can take better decision of replenishment.
4. **Daily Dispatch Analysis:** Dispatch Target vs actual analysis is provided at day, week & month level. Business Users can do dispatch analysis across plant, zone, state, branch, Transport Mode and Packaging level.
5. **Rake Point Analysis:** Rake analysis is provided at detailed level i.e Rake No, Rake type, Location, Commencement date/time, Received Qty & Damag Qty etc,
6. **Geo Analytics:** *Map based analysis of volume (Sales Qty) is provided to business users. Geo Map provides, state to district level drill down analysis and also provide which plant (KC & VC) is catering to different districts.*

Benefits of BI Dashboard:

- ✓ Single version of Truth across organization
- ✓ Timely availability of information to management
- ✓ Enable Faster & better business decision making by users

7.2 BI Dashboard for NSR Contribution

Below analysis can be done:

SECTION-1: NSR - GOAL, ASSUMPTIONS & STEPS TO EXECUTE:

Objective (BKBIET)	1	Compute Invoice-wise NSR (Based on logic provided in SECTION-2)
	2	Compute aggregated “till-date” monthly NSR (Weighted average), based on computation generated out of multiple daily NSR-DUMP files so far received during this processing month.
	3	Compute MIN, MAX, Standard-Deviation of the thus computed actual NSR data
	4	Compute (a) Branch-wise, (b) Trade or Non-Trade mode-wise (c) Day-wise <u>variance of</u> (a) NSR & (b) Quantities Of “Actual” data, deviating from the corresponding “planned” data
	5	Compute required Target run-rate (a) Realization Run rate: (Realization To Be Achieved / Remaining days of the month) , where “Realization To Be Achieved” = (Entire Month’s Planned Realization – Till Date Actual Realization) <u>Please Note:</u> Numerator portion is for the whole month, assuming that “whole month plan” data would be supplied by the user, upfront, in the beginning of the month itself; Further, <u>Realization = NSR * Qty</u> (b) <u>Qty-Run-Rate:</u> [Realization RunRate / (Weighted Average Planned NSR for remaining days of the month)] (c) <u>NSR-Run-Rate:</u> [Realization To Be Achieved / (Planned Qty for remaining days of the month)] (d) <u>Please see the sample workout in the attached excel-file, named</u>
Assumptions (KIL-Cement division)	1	Frequency: Every day “NSR-DUMP”** file will be generated every day @ 2:00 AM. This file will contain all the previous day’s invoice records. Each record will have constituents that would help in computing invoice-wise NSR Please see SECTION-2 for detailed explanation.
	2	Frequency: Multiple times within a month Day Wise Monthly Sales Plan file will contain the latest day-wise target NSR & Qty for the month. This file will be overwritten by any new changes of plan, and its effect has to be taken into consideration along with the next NSR-DUMP file to process Objective No. (4) and (5) as mentioned above.

Steps to execute	1	Pick up the “NSR-DUMP”** file after it is generated from a predefined designated folder (file-path has to be retrieved from a configuration table)
	2	Pick up the “DAY WISE MONTHLY SALES PLAN” file from a predefined designated folder (file-path has to be retrieved from a configuration table)
	3	Compute invoice-wise NSR (Please see SECTION-2)
	4	Develop a report/dashboard/ Pictorial representations, which when invoked, will provide the information as mentioned in the Objective above.
References:	1	(a) Structure of NSR-DUMP file : NSR-DUMP.xls (b) Structure of DAY WISE MONTHLY SALES PLAN (c) Run-Rate Workout: Illustration.xls

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All the components (operands) used for Net Sales Realization (NSR) computation, are all available in the “NSR-DUMP” excel file.

This system-generated excel dump-file (“NSR-DUMP”), gets triggered by a cron-job (scheduler that runs @ 2:00 AM every morning).

In effect, every morning we get a dump file containing invoice-wise information that are eventually used to compute the NSR.

SECTION-2: For each of the row in the NSR-DUMP file, Net Sales Realization is calculated as follows:

Operation	Group	Items	NSR-DUMP column Ref	Comment
Add		Invoice Value	Y	
Subtract	Tax/ GST-Components	IGST Value	Z	Either IGST or (CGST + SGST)
		CGST Value	AA	
		SGST Value	AB	
Subtract	PDs	Price Discounts (PD)	AH	(Dealer Invoice Price <i>minus</i> the Whole Sale Price);
		Non-Trade PD	AU	Manually entered data applicable only for the Non-Trade parties
Subtract	Discounts & incentives	Discounts (Based on Monthly, Quarterly, Annual material-lifts by the dealer);	AG	These are Extrapolated data (See below for itemized explanation);
		Sales Promoter Commission (SP)	AK	
		MMC Commission (Middle-Man-Commission, applicable for both	AI	Actual transactions are posted in the form of Credit-Notes, <u>long after</u>

		Trade & Non-Trade)		these sales actually take place.
		Non-Trade Provision (Incentive Foreign Tours etc.)	AQ	Cement division wants the system to compute the estimated discount from the historically earned discount behaviour of the customer branch.
Subtract	Total Logistic Cost / Total Distribution Cost	Primary Freight	AD	
		Secondary Freight	AE	
		Rail Freight	AT	
		Handling (Loading/ Unloading);	AF	Cement division wants this to be automated into the system.
		Wharfage / Demurrage	AL	Manually entered value
Subtract		Packing Cost (Bag)	AJ	Please note: Loose Cement to non-trade customers is shipped by tankers & it does not involve any "Bag" cost;
Subtract		GENERAL PROVN	AO	Missed out Stock-Transfer Cost/ Other Logistics Cost
Subtract	Misc. Components; Manual Booking; Booked as actuals	GODOWN TRPT RAIL	AM	Any missed out freight costs
		GODOWN TRPT ROAD	AN	
		LOCAL FRT	AP	SPO to SPO, CRWC (Central Rail side Warehouse Corporation) to SPO
		GODOWN SERVICE SOP	AR	C&F Commission/ Service Charges; Charges for the Handling agents etc
		SHORT TERM SCHEME	AS	Part of discounts; Branch wise, short-period-wise (eg: Diwali Dhamaka)

Please note:

In order for Qlick to compute this invoice-wise NSR and then then throw various statistical outputs and pictorial representations, we need to develop an interface scheduler program which should automatically pick up the data from a designated location, every day, at a pre-configured set time (it must be after the NSR-DUMP program-run ends) followed by loading this data in Qlick for further processing.

SECTION-3: VARIABLE COST OF PRODUCTION (COP)

Objective: To calculate the CONTRIBUTION which is (NSR – COP)

We have already enumerated the computation process method for NSR in SECTION-1 & 2, above

We expect the cement division to provide us the month end Trial Balance with indicated ledger balances to be used for the purpose of computing the COP

The proposed system would then extract & compute the SUM of all the indicated ledger balances and divide the same by the total volume of cement sold till the end of that month to arrive at per-unit total variable cost of production