



AUXILIUM COLLEGE (Autonomous)

(Accredited by NAAC with A+ Grade with a CGPA of 3.55 out of 4 in the 3rd cycle)
Gandhi Nagar, Vellore – 6.

6.5 Internal Quality Assurance System

Incremental improvements made for the preceding five years with regard to quality (in case of first cycle). Incremental improvements made for the preceding five years with regard to quality and post accreditation quality initiatives (second and subsequent cycles).

Two Best Initiatives of IQAC

- 1. OBE Implementation**
- 2. QnSmart**



AUXILIUM COLLEGE (Autonomous)

(Accredited by NAAC with A+ Grade with a CGPA of 3.55 out of 4 in the 3rd cycle)
Gandhi Nagar, Vellore – 6.

OBE ATTAINMENT GUIDELINES



AUXILIUM COLLEGE (Autonomous), Vellore - 6

IMPLEMENTATION OF OUTCOME BASED EDUCATION

INTRODUCTION

Outcome Based Education (OBE) is an educational approach that focuses on defining specific learning outcomes or competencies that students should achieve by the end of an educational programme. It is a student-centered instruction model that focuses on measuring student performance through outcomes. Outcomes include knowledge, skills and attitudes. Its focus remains on the evaluation of outcomes of the programme by stating the knowledge, skill and behavior a graduate is expected to attain upon completion of a programme.

The key features for implementation of Outcome Based Education are:

- Development of curriculum framework that outlines specific and measurable outcomes.
- Instructional methodology to ensure delivery for specified outcomes.
- Standards-based assessments that determine whether students have achieved the stated standards.

OUTCOME BASED EDUCATION AT AUXILIUM COLLEGE

Outcome-Based Education is a student-centric teaching and learning methodology in which the course delivery and assessment is planned to achieve stated objectives and outcomes. It focuses on measuring student performance, i.e., outcomes at different cognitive levels.

In adherence to the UGC and NAAC guidelines, Auxilium College (Autonomous) adopted Outcome Based Education for students admitted from 2020-2021 onwards. The curriculum framework was revised for all the Undergraduate and Postgraduate Programmes with special focus on the knowledge, understanding, skills, attitudes and values that the students should have attained on the completion of the programmes.

PROGRAMME OUTCOMES (PO)

Programme Outcomes (POs) are broad statements that describe what students are expected to know and be able to do by the time they graduate from a specific academic programme, and are framed in alignment with the vision and mission of the institution

and cater to the holistic development of students. These outcomes provide an overall picture of the knowledge, skills, and attitudes that students should have acquired throughout their course of study. The Programme Outcomes framed for different levels of study programme are given below.

Undergraduate Programme:

On completion of the UG Programme, students will be able to;

PO1: Attain knowledge and understand the principles and concepts in the respective discipline.

PO2: Acquire and apply analytical, critical and creative thinking, and problem-solving skills.

PO3: Effectively communicate general and discipline-specific information, ideas and opinions.

PO4: Appreciate biodiversity and enhance eco-consciousness for sustainable development of the society.

PO5: Emulate positive social values and exercise leadership qualities and team work.

PO6: Pursue higher knowledge, qualify professionally, enhance entrepreneurial skills and contribute towards the needs of the society.

Postgraduate Programme:

On completion of the PG Programme, students will be able to;

PO1: Attain an in-depth knowledge in the respective domains augmented through self-learning.

PO2: Assimilate and apply principles and concepts towards skill development and employability.

PO3: Apply critical and scientific approaches to address problems and find solutions.

PO4: Develop research skills through multi/inter/trans-disciplinary perspectives.

PO5: Integrate issues of social relevance in the field of study.

PO6: Persist in life-long learning for personal and societal progress.

M.Phil. Programme:

On completion of the M.Phil. Programme, scholars will be able to;

PO1: Develop research aptitude in the respective discipline.

PO2: Master the framework of research process.

PO3: Acquire technical and writing skills to communicate research findings.

PO4: Engage in ethically oriented original research for the benefit of the society.

PO5: Design innovative research techniques and find probable solutions to socially relevant research problems.

PO6: Commit to life-long learning with the intellectual interest created.

Ph.D. Programme:

On completion of the Ph.D. Programme, scholars will be able to:

PO1: Acquire expertise in specific areas of study.

PO2: Formulate, analyze and apply theories and design methodologies.

PO3: Focus on socially relevant research and follow research ethics.

PO4: Gain skills to write research and project proposals for grants.

PO5: Network and offer consultancy at national and international levels.

PO6: Strive to obtain Intellectual Property Rights for inventions and innovations.

PROGRAMME SPECIFIC OUTCOMES (PSO)

Programme Specific Outcomes (PSO) denote discipline-specific knowledge, understanding, skills, attitudes and values that the student should have attained on completing the particular programme, and are measurable so that the attainment can be assessed objectively.

Auxilium College (Autonomous) offers 16 UG, 12 PG and 8 Ph.D. programmes. There are six Programme Specific Outcomes formulated for each programme.

COURSE OUTCOMES (CO)

Course Outcomes (COs) are specific statements that describe the knowledge, skills, abilities, and attitudes that students are expected to achieve by the end of a particular course. These outcomes are derived from the broad programme outcomes and are designed to be achievable within the duration and scope of the specific course. COs serve as a guide for instructors, students, and other stakeholders to understand the intended learning goals of a course.

There are five Course Outcomes, one for each unit, articulated for each course. By clearly defining Course Outcomes, educators can ensure that their teaching aligns with the overall goals of the programme and provides students with a structured and purposeful learning experience.

SYLLABI

The syllabi of all Programmes include Programme Outcomes (POs), Programme Specific Outcomes (PSOs), and course objectives, Course Outcomes (COs), content, text books and references for the various courses.

Each course content is divided into five units and each unit is further split into 6 subunits. The expected Cognitive Knowledge Levels (K1/K2/K3/K4/K5/K6) to be attained out of each subunit are specified in the course content.

Knowledge Levels as per Bloom's Taxonomy

LEVELS	PARAMETERS	DESCRIPTION
K1	Knowledge	It is the ability to remember the previously learned information.
K2	Comprehension	It is the ability to grasp the meaning of the concept.
K3	Application	It is the ability to use learned material in new and concrete situations.
K4	Analysis	It is the ability to relate, connect, compare and contrast the ideas.
K5	Evaluation	It is the ability to interpret, criticize, justify, appraise idea/concept/information.
K6	Create	It is the ability to create, compose, reconstruct concept/statement/research work for a given purpose.

MAPPING BETWEEN PO AND PSO

Developing a mapping document or matrix that clearly shows the alignment between Programme Outcomes and Programme Specific Outcomes is essential to determine how each programme-specific outcome contributes to or aligns with the achievement of the overall programme outcomes. It also ensures that the programmes offered by the institution are focused, coherent, and effectively prepare students for their careers or further studies in the field.

The six Programme Outcomes of UG/PG/M.Phil./Ph.D., are mapped with Programme Specific Outcomes on a 3-point scale having H for highly correlated, M for moderately

correlated and L for least correlated.

MAPPING CO WITH PSO

Mapping Course Outcomes (COs) with Programme Specific Outcomes (PSOs) is a systematic process that ensures students graduate with the knowledge, skills, and attributes necessary to excel in their chosen fields.

Course Outcomes of each course of a programme are mapped with PSOs on a 3-point scale having H for highly correlated, M for moderately correlated and L for least correlated.

MAPPING CO WITH PO

Mapping Course Outcomes effectively with Programme Outcomes ensures that the courses collectively contribute to the overarching goals of the academic programme.

Course Outcomes of each course of a programme are mapped with POs on a 3-point scale having H for highly correlated, M for moderately correlated and L for least correlated.

ASSESSMENT

Assessment is a core academic activity and an essential component of the learning process. It is an ongoing process to support educational quality and student achievement. It is the main mechanism to monitor the effectiveness of the learning environment based on evidences that determine whether students have met the learning outcomes. The College makes sure that assessment occurs consistently and systematically to ensure quality education.

Assessment is done by two ways – Formative (internal) and Summative (end semester)

- Internal – Two Continuous Assessment Examinations (ICA and II CA), Innovative Component (IC) – assignments/seminars/projects/open book assignments/model making/report writing/debates/field visits/industrial visits/internship/oral presentations etc.
- Summative – End semester examinations.

S. No.	Assessment Tool	Maximum Marks	Weightage	
1.	I Continuous Assessment (ICA)	50	35	40
	II Continuous Assessment (IICA)	50		
	Innovative Component	5	5	

	(IC)			
2.	End Semester Examination	100		60

ATTAINMENT OF OUTCOMES

The following procedure is adopted to measure students' performance with respect to OBE concept. The flow of measurement is taken from students' marks obtained in the internal (I CA, II CA & IC) and semester examinations. The marks are then converted to scores on a 3-point scale to check whether they meet the Course Outcomes (COs) set by the course instructor. After getting the Course Outcome scores, the contribution of each CO to Programme Specific Outcomes (PSOs) and Programme Outcomes (POs) is measured progressively until students complete their 3/2-year UG/PG programme. The various steps that are involved in this method are:

- Mapping questions (internal/semester) with COs and Bloom's Taxonomy K levels.
- Including questions in the question paper (internal/external) at all K levels (K1 to K6) for PG / including questions up to K4 levels and assessing the students' performance at K5/K6 levels through IC tools for UG.
- Entering marks question wise (internal/semester) in the ERP portal.
- The threshold value is 40% for UG courses, and 50% for PG courses for CO attainment calculation.
- Considering 20% weightage for CO scores obtained from internal assessments and 80% weightage for CO scores obtained from semester examinations to calculate the overall attainment of various COs of a particular course.
- Calculating the COs attainment scores for each course, and the contribution of COs to obtain PSOs & POs attainment scores by the software.
- Calculating students' attainment of COs and K levels and reporting in the form of diagrams/graphs by the software.
- If the calculated scores of COs, PSOs and POs are $\geq 40\%$ for UG courses and $\geq 50\%$ for PG courses of the targeted values given in the mapping tables, then the outcomes are achieved or attained.
- Listing actions/corrective measures to be initiated to achieve the targeted attainment values in case they are not achieved.

ACTION TAKEN REPORT

The attained percentages are analysed to understand how well students have collectively achieved each Course Outcome and the areas where students performed

exceptionally well and areas that might need improvement are identified. Accordingly, specific action plans/corrective measures are to be developed and implemented to achieve the targeted attainment values. The assessment data, student feedback, and other relevant indicators will be used to evaluate the effectiveness of the implemented changes. The Action Taken Report summarizing the identified issues, action plans, implementation details, outcomes, and plans for further improvement will be prepared and documented.

CONTINUOUS IMPROVEMENT

The attainment data will be used as a basis for continuous improvement in the course design, teaching methods, and assessment strategies and to make necessary adjustments to enhance student learning and improve Course Outcome Attainment in subsequent offerings of the course. Continuous monitoring and adjustment are essential to ensuring that the course remains effective and aligned with its intended learning outcomes.

AGGREGATE AND REPORT

The attainment data for all Course Outcomes will be aggregated and a report summarizing the overall attainment levels will be prepared and shared with stakeholders, including students, faculty, and relevant administrative bodies.

IMPLEMENTATION AND MONITORING

Implementation of OBE will be the responsibility of-

- IQAC Coordinator
- Controller of Examinations
- Deans/Heads of the Departments/Faculty
- Curriculum Development Cell

Dr. Jayashree

PRINCIPAL
AUXILIUM COLLEGE (Autonomous)
Gandhi Nagar, Vellore - 632 006.
Vellore District, Tamil Nadu.

S. Parvathi

Controller of Examinations
Controller of Examinations,
Auxilium College (Autonomous)
Gandhi Nagar, Vellore - 632 006.

QnSmart Software Application

(OBE Enabled)

for

Auxilium College, Vellore

2020

Project Proposal

QnSmart Software Application

(OBE Enabled)

for

Auxilium College, Vellore

Prepared by:
ipsr solutions ltd
ML Road, Kottayam
Kerala, India - 686 001
Mob: +91- 9496401306
E-mail: qnsmart@ipsrsolutions.com

Ref. No.: IPSR170519

Version Number	Date	Description
1.0	17 th May 2019	Initial Proposal Submitted
1.1	27 th November 2019	Revised Proposal Submission

ipsr solutions ltd. submits this confidential document to **M/s. Auxilium College, Vellore** for the sole purpose of evaluating vendor proposals. Contents of this document shall not be reproduced or provided to any persons other than the staff of **M/s. Auxilium College, Vellore** without express written permission from ipsr solutions ltd.

1. Introduction

ipsr solutions ltd, Merchants Association Building, ML Road, Kottayam - 686 001, Kerala, India hereby submits the proposal for design and development of software for **M/s. Auxilium College, Vellore.**

2. Product Overview

QnSmart by IPSR is web based software solution for question paper generation in academic institutions.

Features of **QnSmart** :-

- Role based access, where the same user can have multiple Roles.
- Automated Email Notifications and Dashboard Notifications about Question Bank Health.
- **Administrator** creates various users and assigns Roles.
- **Controller of examinations (CoE)** can generate question papers.
- **CoE** can also download Question Bank for Students use or for review by experts.
- **Answer key** also may be generated, if the details are entered.
- ✓ ➤ For OBE, CO mappings for the question paper may also be downloaded.
- Can be used for all exams - Internals, Model exams, Main exams, Supplementary exams etc.
- Automatically rules out topics repetition in a question paper.
- Repetition of questions asked in previous year can be controlled, by setting desired percentage of repetition allowed. This will help to adhere to University regulations regarding the same.
- Any type of question paper can be generated - parts of question paper, number of questions etc are configurable.
- Question paper rules can be set up by the CoE - can be the same or different for different courses.
- Criteria for **Bloom's Taxonomy, Difficulty levels, Importance levels and Question types** to ensure that desired question types are included in the Question Paper
- Random selection of questions ensure transparency and coverage of the entire syllabus and Blueprint ensure that desired distribution is achieved.
- Visual verification options of question paper quality - question sufficiency, distribution, difficulty - for CoE and concerned faculty

- Question paper generated as HTML, which can be edited to adjust formatting. Doc, Pdf options also available
- Preserve the question banks of previous syllabus for years, so that exams like, supplementary exams may be conducted without delay.
- **HoD** can view and verify the Question Bank status of each Course.
- ✓ **HoD/HoD Assistant** can generate Internal Exam question papers for the Department, based on relevant Modules/Units (relevant portions).
- **Teachers** can structure the question bank and add questions from the entire syllabus.
- Option to add Course Outcomes.
- Any type of question - objective, one word, short answer, long answer - can be added.
- Answer key for each question may also be added.
- Very simple process of structuring question paper patterns - an outline plan on the different sections of the Question Paper, number of questions in each section and marks for each section. One pattern for final exam and one for the internal exams are allowed.
- Blueprint option to plan the weightage of different modules in the Syllabus, in a Question Paper.
- Supports Mathematical, Scientific and Electrical/Electronics symbols in questions
- Bulk upload of questions using MS Excel (xlsx) for Text type questions.
- Questions with tables, figures etc can be entered directly in the QnSmart interface.
- May create placeholder questions.
- Questions created by one Teacher can only be viewed by others and not edited.
- Support for 100+ languages (unicode only). Supports Google Input tool. Handwriting options in the Google Input tool for Malayalam and Hindi also supported.
- When a new Syllabus is created, Questions may be migrated from the previous question banks. So need to create the questions for changed topics only.
- Add questions once and reuse them forever.
- Standardisation and validation: Bloom's taxonomy and difficulty levels ensure that all the question papers generated will adhere to basic standards.
- Question type (theory/application) and Importance level also can be set.

- Once the required Questions are added in the question bank, the teacher can download the questions in an excel file and to map them to relevant Course Outcomes along with the strength against attainment scale.
- NAAC/UGC standards: Maintain and supply question banks to students and create digital repositories of old question papers, leading to better grading scores.
- Security: access to the system bound by authentication and authorization mechanism.
- Cost effective: Can avoid the yearly spending of huge amounts, as the required question papers can be generated for FREE!

3. Technology Proposal

User Interface	Browser based, implemented using HTML, CSS, Ajax, JavaScript, XML, MathML etc
Business logic and Workflow Management	Java
Data Management	MySQL
Platform	Linux

4. Time Schedule

The estimated time span to complete the entire project shall be 20 working days after placing work order and obtaining the required data and infrastructure.

Project Proposal

QnSmart Software Application

(OBE Enabled)

for

Auxilium College, Vellore

Prepared by:

ipsr solutions ltd

ML Road, Kottayam

Kerala, India - 686 001

Mob: +91- 9496401306

E-mail: gnsmart@ipsrsolutions.com

Ref. No.: IPSR170519

Version Number	Date	Description
1.0	17 th May 2019	Initial Proposal Submitted
1.1	27 th November 2019	Revised Proposal Submission

ipsr solutions ltd. submits this confidential document to **M/s. Auxilium College, Vellore** for the sole purpose of evaluating vendor proposals. Contents of this document shall not be reproduced or provided to any persons other than the staff of **M/s. Auxilium College, Vellore** without express written permission from ipsr solutions ltd.

1. Introduction

ipsr solutions ltd, Merchants Association Building, ML Road, Kottayam - 686 001, Kerala, India hereby submits the proposal for design and development of software for **M/s. Auxilium College, Vellore.**

2. Product Overview

QnSmart by IPSR is web based software solution for question paper generation in academic institutions.

Features of **QnSmart** :-

- Role based access, where the same user can have multiple Roles.
- Automated Email Notifications and Dashboard Notifications about Question Bank Health.
- **Administrator** creates various users and assigns Roles.
- **Controller of examinations (CoE)** can generate question papers.
- **CoE** can also download Question Bank for Students use or for review by experts.
- **Answer key** also may be generated, if the details are entered.
- For OBE, CO mappings for the question paper may also be downloaded.
- Can be used for all exams - Internals, Model exams, Main exams, Supplementary exams etc.
- Automatically rules out topics repetition in a question paper.
- Repetition of questions asked in previous year can be controlled, by setting desired percentage of repetition allowed. This will help to adhere to University regulations regarding the same.
- Any type of question paper can be generated - parts of question paper, number of questions etc are configurable.
- **Question paper rules** can be set up by the CoE - can be the same or different for different courses.
- Criteria for **Bloom's Taxonomy, Difficulty levels, Importance levels and Question types** to ensure that desired question types are included in the Question Paper
- Random selection of questions ensure transparency and coverage of the entire syllabus and Blueprint ensure that desired distribution is achieved.
- Visual verification options of question paper quality - question sufficiency, distribution, difficulty - for CoE and concerned faculty

- Question paper generated as HTML, which can be edited to adjust formatting. Doc, Pdf options also available
- Preserve the question banks of previous syllabus for years, so that exams like, supplementary exams may be conducted without delay.
- **HoD** can view and verify the Question Bank status of each Course.
- **HoD/HoD Assistant** can generate Internal Exam question papers for the Department, based on relevant Modules/Units (relevant portions).
- **Teachers** can structure the question bank and add questions from the entire syllabus.
- Option to add Course Outcomes.
- Any type of question - objective, one word, short answer, long answer - can be added.
- Answer key for each question may also be added.
- Very simple process of structuring question paper patterns - an outline plan on the different sections of the Question Paper, number of questions in each section and marks for each section. One pattern for final exam and one for the internal exams are allowed.
- Blueprint option to plan the weightage of different modules in the Syllabus, in a Question Paper.
- Supports Mathematical, Scientific and Electrical/Electronics symbols in questions
- Bulk upload of questions using MS Excel (xlsx) for Text type questions.
- Questions with tables, figures etc can be entered directly in the QnSmart interface.
- May create placeholder questions.
- Questions created by one Teacher can only be viewed by others and not edited.
- Support for 100+ languages (unicode only). Supports Google Input tool. Handwriting options in the Google Input tool for Malayalam and Hindi also supported.
- When a new Syllabus is created, Questions may be migrated from the previous question banks. So need to create the questions for changed topics only.
- Add questions once and reuse them forever.
- Standardisation and validation: Bloom's taxonomy and difficulty levels ensure that all the question papers generated will adhere to basic standards.
- Question type (theory/application) and Importance level also can be set.

- Once the required Questions are added in the question bank, the teacher can download the questions in an excel file and to map them to relevant Course Outcomes along with the strength against attainment scale.
- NAAC/UGC standards: Maintain and supply question banks to students and create digital repositories of old question papers, leading to better grading scores.
- Security: access to the system bound by authentication and authorization mechanism.
- Cost effective: Can avoid the yearly spending of huge amounts, as the required question papers can be generated for FREE!

3. Technology Proposal

User Interface	Browser based, implemented using HTML, CSS, Ajax, JavaScript, XML, MathML etc
Business logic and Workflow Management	Java
Data Management	MySQL
Platform	Linux

4. Time Schedule

The estimated time span to complete the entire project shall be 20 working days after placing work order and obtaining the required data and infrastructure.

5. Commercial Proposal

Basic license of QnSmart Application (up to 20 programmes) and Implementation	:	INR 4,90,000.00
05 Additional programmes (@ Rs. 15000/- per programme)	:	INR 75,000.00
OBE Enablement for Question Banks	:	INR 50,000.00
<hr/>		
Total (up to 25 programmes)	:	INR 6,15,000.00
<hr/>		
20th Anniversary Offer	:	INR 50,000.00
Special Discount for Basic license	:	INR 65,000.00
<hr/>		
Total Discount	:	INR 1,15,000.00
<hr/>		
License of OBE enabled QnSmart Application (up to 25 programmes):	:	INR 5,00,000.00
Tax (GST @ 18%)	:	INR 90,000.00
<hr/>		
GRAND TOTAL	:	INR 5,90,000.00

(Indian Rupees Five Lakhs Ninety Thousand Only)

- ❖ License for Additional Programmes above **25** will be @ **Rs. 15000/-** per programme, during the 3 years after the Implementation Date.

5.1. Payment Terms

- a. 50% of the total cost shall be paid along with the purchase order.
- b. Remaining 50% shall be paid within a week after the implementation of the application or after 45 days from the execution of the agreement, whichever is earlier.
- c. Tax applicable at the time of payment to be considered.

5.2. Additional Expenses

Additional cost will be charged for the following:

- a. Incorporation of additional features or customisations, which are beyond the scope of this proposal; rates based on the requirement
- b. Customisation of the Question Paper Pattern/ evaluation structure.

- c. Hosting requirements if any
- d. Additional Programme licenses as applicable

5.3. AMC/Maintenance

For the second year (1 year after the date of implementation) 15% of the total project cost need to be paid as the AMC charges to the Company.

- 100% of AMC charges along with the AMC order.
- Version updates relevant for the software license will be made freely during the AMC period.

Version updates are the updations which are intended for stability and security of the implemented software application. Functionality updations will not be considered as version updations. Functionality updations will be charged additionally based on the then agreed terms after issuing a request for change.

AMC shall become active once the same has been agreed upon and the relevant payment has been made. Rate of AMC may vary from 3rd year onwards.

6. Server environment

The server environment will be provided and maintained by the College, locally at the College premises.

College should be responsible to provide a static IP and domain name or subdomain. This will be the URL to access the software.

Specifications

- 2.4 GHz Quad Core processor or above
- 8GB RAM or above with 2133MHz recommended
- Internet Connectivity with at least 2 Mbps recommended (1 : 1)
- Static IP - 01 Nos
- OS : CentOS 7+
- Kernel version: 3.10 or above
- Java 1.8 or above
- Tomcat 8.0.27 (exact version required)
- MySQL 5.7 or above / MariaDB 10.1 or above

Alternatively, a Cloud instance of similar capacity may also be used.

Backups and Maintenance

- The Server maintenance and backups need to be done by the College

- Backup process for the QnSmart application will be configured by the Company, as a cron job in Server. The College's needs to ensure that cron job is running and the backups are safely stored.

7. Terms and Conditions

7.1. Validity

This offer is valid for 30 days from the quotation date.

7.2. Warranty

IPSR warrant that the Program shall conform to the Requirements List agreed upon and will be fully operational at the time of Acceptance by the Customer.

If the Customer demonstrates that the software suffers from any Defect during the period of 1 year from the date of implementation, IPSR will, for no additional charge, carry out any work necessary in order to remedy the Defect.

If new features need to be added or the programming code has to be substantially altered beyond the Requirements, those changes shall not be considered minor and will not be covered by this contract. Substantial changes are defined as adding/deleting of programming logic, the structure of the database, variables or any other customization of programming elements.

Any major/ minor changes which are paid or unpaid shall be decided after an 'Impact Analysis for Change Request' which evaluates the effect due to a change and the effort to make that change.

This foregoing warranty does not apply to any finished version that has been subject to misuse, unauthorised modification, neglect, improper installation or attempts to repair/modifications done by teams other than IPSR, accident, flood, fire, radiation or any other hazard.

7.3. Support

Support Requests: Customer may raise requests for support, to the designated email id, from their authorised mail id. Such requests will be classified as below and responded. Resolution time will depend on the effort required.

Type	Description	Response time
Critical	Any issues that may stop the software from proper functioning	In the next 4 working hours

High Priority	Prioritised by customer or by IPSR based on the nature of the requirement	In the next 8 working hours
Low priority	Prioritised by customer or by IPSR based on the nature of the requirement	In the next 20 working hours

7.4. Unlawful use or content

The Customer must ensure that the use of the software and the contents therein, will not infringe any person's Intellectual Property Rights [or other legal rights] and will be in accordance with the relevant laws.

The Customer hereby indemnifies and undertakes to keep indemnified IPSR against any and all damages, liabilities, costs, losses and expenses (including legal expenses) suffered or incurred by IPSR and arising out of any breach by the Customer of the above Clause.

Nothing in the Agreement shall restrict IPSR from making any disclosure of Confidential Information that is:

- a. Required by law; or
- b. Required by a governmental authority, stock exchange or regulatory body, provided that IPSR must where permitted by law give to the Customer prompt written notice of the disclosure requirement.

7.5. Intellectual Property Rights

All Intellectual Property Rights of the Source Code of the Software Application will be assigned with the Company with the following exceptions.

While using any Open Source technologies or other licensed technologies, built-in software codes for specific purposes are readily available for customisation and both the parties of this agreement cannot claim the ownership of such software codes.

These rights are assigned for the whole term of such rights together with all reversions, revivals, extensions and renewals, and this assignment includes the right to bring proceedings for past infringement of the assigned Intellectual Property Rights.

The College will be granted only a license to use this product for the specified programmes and may use it till the licenses are valid.

7.6. Jurisdiction

This Agreement will be governed by and construed in accordance with the laws of India; and the courts of Kottayam will have exclusive jurisdiction to adjudicate any dispute arising under or in connection with this Agreement.

8. Requirements from Client

The College is expected to provide the following requirements, without delay, as and when required by IPSR.

- Provide any information or data as required for the implementation of the application
- Provide logo or any other imagery of college as may be required from case to case
- Provide necessary hosting and technical environment so as to implement the application
- Arrange necessary meetings with the responsible staff, as required for the implementation of the application
- Appoint a competent person as a Single Point of Contact, regarding the communication about the application and its implementation

9. Queries/Support

For any Queries/Support requests contact us at qnsmart@ipsrsolutions.com or +919496401306

Software License and Implementation Agreement

This Software License and Implementation Agreement ("Agreement") is made and entered into as of the **10th day of January 2020** (the "Effective Date"), by and between **Ipsr solutions Ltd.**, a software development company, having its principal place of business at Merchant's Association Bldgs., M.L Road, Kottayam-686 001, Kerala, India (the "Company"),

and

Auxilium College (Autonomous), Gandhi Nagar, Vellore, Tamil Nadu 632 006, India (the "College"), which is an autonomous college. The College provides various UG and PG programmes in different streams.

The College desires to assign the Company to make available required licenses of QnSmart - the Question Bank and Question Paper generation software, for use in their evaluation process and also to provide the supports after its implementation during the agreement period. Details of the proposed module is as that described in the Statement of Work and Company is willing to perform such services, on terms set forth more fully below. In consideration of the mutual promises contained herein, the parties agree as follows:

AGREEMENT:

1. Definitions and Interpretations

In this Agreement:

"Agreement" means this agreement (including the Statement of Work) and any amendments to it from time to time;

"Business Day" means any working day to the company

"Business Hours" means between 09:00 and 17:30 Indian time on a Business Day;

"CCN" means a change control notice issued by any party of this agreement

"CCN Consideration Period" means the number of Business Days following the receipt of a CCN sent by the other party;

"Change" means any change to the terms of the Agreement including for the avoidance of doubt any change to software application specification in the Statement of Work);

"Charges" means the amounts payable by the College to the Company under or in relation to this Agreement as set out in the agreement.

"Confidential Information" means:

any information disclosed by the College to the Company during the Term (whether disclosed in writing, orally or otherwise) that at the time of disclosure:

(i) was marked as "confidential"; or

(ii) should have been reasonably understood by the Company to be confidential;

"Customer Works" means the works and materials provided to the Company by the college, or by any third party acting for or on behalf of the College, including logos, designs etc for incorporation into the proposed Software Application;

"Defect" means a defect, error or bug having an adverse effect on the appearance, operation or functionality of the Software Application;

"Implementation" means the completion of initial installation of the Software Application and initial user training viz the Workshop/Seminar for the users;

"Effective Date" means the date of execution of this Agreement;

"Recurring licenses" License fees those are to be paid annually.

"Force Majeure Event" means an event, or a series of related events, that is outside the reasonable control of the party affected (including failures of or problems with the internet or a part of the internet, hacker attacks, virus or other malicious software attacks or infections, denial of service attacks, power failures, industrial disputes affecting any third party, changes to the law, disasters, explosions, fires, floods, riots, terrorist attacks and wars);

"Intellectual Property Rights" means all intellectual property rights wherever in the world, whether registered or unregistered, including any application or right of application for such rights (and the "intellectual property rights" referred to above include copyright and related rights, database rights, confidential information, trade secrets, know-how, business names, trade names, trademarks, service marks, passing off rights, unfair competition rights, patents, petty patents, utility models, and rights in designs);

"Statement of Work" means the statement of work attached to this agreement;

"Third Party Works" means the works, materials or software used to create and run the Software Application, the Intellectual Property Rights in which are owned in whole or part by a third party (excluding the Customer Works);

"Term" means the term of this Agreement; and

"Software Application" means the QnSmart software to be installed by the Company for the College under this Agreement.

2. Term

This Agreement will come into force on the Effective Date and will continue in force for one year from the date of implementation of the Software Application by the Company, in accordance with terms specified later in this agreement.

3. Scope of Services

The Company will:

- deliver the Software Application and provide its implementation support. Implementation support includes workshops or seminars for user training, as specified in the Statement of Work.
- incorporate the Customer Works within the scope specified in the Statement of Work or agreed in writing by the parties, together with the Third Party Works, into the Software Application.
- configure backup locally or online as per provisions.
- provide the College with reasonable access to the Software Application during the Term.
- deliver the latest available backup to the client without unreasonable delay.

College will:

- provide the Company with such cooperation as is required by the Company to enable the performance by the Company of its obligations under this Agreement.
- grant to the Company relevant license to copy and use the Customer Works during the Term for the purposes of fulfilling its obligations and exercising its rights under this Agreement.
- not install or use the Software Application coming under this agreement in any other institution/sister concerns of the College, without additional licenses and will not try to duplicate it.

- ensure that questions used in this Software Application for evaluation processes are as per the norms set by the University and/or other governing bodies.

Both the Company and the College agree:

- to arrange a competent person from their side, as a single point of contact (SPOC) to deal with the other in all matters relating to this agreement
- to use a single primary email id for initiating all communications relevant to this agreement.

4. Change Control

The provisions of this section apply to all Changes requested by a party.

Either party may request a Change at any time.

When requesting a Change, the requesting party will notify the other party and provide a CCN. The CCN will set out (as a minimum):

- a) details of the impact on the timetable for the provision of the Services;
- b) details of any Customer Works and Third Party Works that will be required as a result of the Change; and
- c) details of any variation to the Charges consequent upon the Change.

The other party will consider any proposed Change and respond to any CCN within the CCN Consideration Period.

Either party may:

- a) accept or reject a CCN issued by the other party;
- b) request further information concerning any aspect of a CCN issued by the other party; and/or
- c) request amendments to a CCN issued by the other party.

Following agreement of a CCN, each party will confirm its agreement to the CCN by:

- a) signing a copy of the CCN and sending the signed CCN to the other party; or
- b) otherwise emailing its acceptance of the CCN to the other party.

Until a CCN recording a proposed Change has been signed or agreed in writing (including email) by each party, the proposed Change will not take effect.

5. Unlawful Content

The College must ensure that the Customer Works will not infringe any person's Intellectual Property Rights or other legal rights under applicable law and

The College will also ensure the validity, relevance and legality of questions used and it's answers.

6. Price and Payment Terms

Taxes will be applied at the rates applicable during the payment period, on top of all Charges stated in.

6.1. Cost Overview

License of OBE enabled QnSmart Application (up to 25 programmes)	: INR 5,00,000.00
Tax (GST @ 18%)	: INR 90,000.00
<hr/>	
TOTAL	: INR 5,90,000.00

(Indian Rupees Five Lakh Ninety Thousand only)

6.2. Payment Terms

- 50% of the total cost shall be paid on the Effective Date(10-01-2020).
- Remaining 50% shall be paid within 3 days of the Implementation Date.
- License for Additional Programmes above 25 will be @ Rs. 15000/- per programme, during the 3 years after the Implementation Date.
- Any feature additions or customisations in the Software Application shall be chargeable extra.

6.3. AMC/Maintenance

For the second year (1 year after the completion of 1 year from the date of implementation), the Company shall provide maintenance support to the College, based on the following conditions

- 15% of the total project cost need to be paid as the AMC charges to the Company by the College.

- Total project cost will be calculated as the sum of initial and additional licenses, as well as customisations made till the previous year (exclusive of taxes).
- 100% of AMC charges to be paid along with the AMC order.
- Important version updates of the software will be made freely available to the College, during the AMC period.
Version updates are the updations in the Software Application, which are intended for stability and security of the application. Functionality updations will not be considered as version updates. Functionality updations will be charged additionally based on the then agreed terms after issuing a CCN.
- AMC will include 1 day of refresher user training.
- AMC shall not cover any recurring third party license fees

AMC shall become active once the same has been agreed upon and the relevant payment has been made.

Rates and terms of AMC may change from 3rd year onwards and has to be decided after mutual discussions and agreement. However, the increase shall not exceed 33% of the total of previous year AMC amount and 12.5% of the cost of customisations made during the previous year.

7. Intellectual Property Rights

All Intellectual Property Rights of the Source Code of the Software Application will be assigned with the Company with the following exceptions.

While using any Open Source or Third Party technologies, built-in software codes for specific purposes are readily available for customisation and both the parties of this agreement cannot claim ownership of such software codes.

These rights are assigned for the whole term of such rights together with all reversions, revivals, extensions and renewals, and this assignment includes the right to bring proceedings for past infringement of the assigned Intellectual Property Rights.

College will get only a right to use this product and can use it 'as is' till a date that it wish. But the support from the Company will be governed by the respective sections in this Agreement.

8. Warranties and Indemnity

The Company warrants and represents to the College:

- a) that it has the legal right and authority to enter into and perform its obligations under this Agreement;

- b) that it will perform its obligations under this Agreement with reasonable care and skill and to a good professional standard;
- c) that the Software Application (excluding the Customer Works) will not infringe any person's Intellectual Property Rights or other legal rights;
- d) that the software Application will operate without any Defects.

If the College demonstrates to the Company that the Software Application suffers from any Defect during the period of 1 year following the date of implementation, the company will, for no additional charge, carry out any work necessary in order to remedy the Defect.

This foregoing warranty does not apply to any finished version that has been subject to misuse, unauthorised modification, neglect, improper installation or attempts to repair/modifications done by teams other than company, accident, flood, fire, radiation or any other hazard.

The Company hereby indemnifies and undertakes to keep indemnified the College against damages, liabilities, costs, losses and expenses (including legal expenses) suffered or incurred by the College:

- to the extent based on the claim that the software development methods used by the Company to develop/provide the finished version or misappropriate any intellectual property rights of a third party inclusive of third party technology;
- arising from the negligence or willful misconduct of the Company or any of its respective employees or agents as the case may be;

The College hereby indemnifies and undertakes to keep indemnified the company against damages, liabilities, costs, losses and expenses (including legal expenses) suffered or incurred by the Company due to:

- unauthorised access or modification of software / design elements in the development, test & hosting environments during development/implementation and during the warranty period by the College;
- any breach by the College of legal acceptance of the content.
- any violation by the colleges of the norms set by the governing bodies.

9. Limitations and Exclusions of Liability

Nothing in the Agreement will:

- limit or exclude the liability of a party for fraud or fraudulent misrepresentation by that party;

- limit any liability of a party in any way that is not permitted under applicable law; or
- exclude any liability of a party that may not be excluded under applicable law.

The limitations and exclusions of liability set out here and elsewhere in the Agreement:

govern all liabilities arising under the Agreement in relation to the subject matter of the Agreement, including liabilities arising in contract, in tort (including negligence) and for breach of statutory duty; and the liability of the parties under the express indemnities set out in the Agreement.

College will ensure that the defined Software Application under this agreement meets the business objectives of the College.

10. Data Protection

The Company warrants that:

it will act only on instructions from the College in relation to the processing of any Personal Data performed by the Company on behalf of the College; and

it has in place appropriate security measures (both technical and organisational) against:

- unlawful or unauthorised processing; and
- loss or corruption of Personal Data processed by the Company on behalf of the College.

It is the responsibility of the College to take security measures to prevent misuse of Software Applications/data in locally used machines or and ensure best practices in the usage of the Software Application.

11. Confidentiality and Publicity

The Company will:

keep confidential and not disclose the Confidential Information to any person save as expressly permitted by the following

- protect the Confidential Information against unauthorised disclosure by using the same degree of care as it takes to preserve and safeguard its own confidential information of a similar nature, being at least a reasonable degree of care.
- Confidential Information may be disclosed by the Company to the Company's officers, employees, agents, insurers and professional

advisers, provided such disclosure is essential for the development and implementation of the Software Application.

The obligations set out in these paragraphs shall not apply to:

- a) Confidential Information that is publicly known (other than through a breach of an obligation of confidence);
- b) Confidential Information that is in possession of the Company prior to disclosure by the College; or
- c) Confidential Information that is received by the Company from an independent third party who has a right to disclose the relevant Confidential Information.

Nothing in the Agreement shall restrict the Company from making any disclosure of Confidential Information that is:

- a) required by law; or
- b) required by a governmental authority or regulatory body,

12. Termination

The College may terminate this Agreement:

- at any time by giving at least 30 days' written notice or email to the company; or
- immediately by giving written notice or email to the Company if the Company commits any breach of any term of this Agreement.

The Company may terminate this Agreement by giving written notice or email to the College if:

- the College commits any breach of any term of this Agreement; or
- the College has failed to make any payment due to the Company under this Agreement by its due date; and
- the College does not remedy the default within 30 days of receipt of a notice requiring it to do so.

Either party may terminate this Agreement immediately by giving written notice to the other party if:

- a) the other party:
 - i. is dissolved;
 - ii. ceases to conduct all (or substantially all) of its business;

- iii. is or becomes unable to pay its debts as they fall due;
- iv. is or becomes insolvent or is declared insolvent; or
- b) an administrator, administrative receiver, liquidator, receiver, trustee, manager or similar is appointed over any of the assets of the other party;
- c) an order is made for the winding up of the other party, or the other party passes a resolution for its winding up.

13. Effects of Termination

Termination of this Agreement will not affect either party's accrued rights (including the Company's accrued rights invoice for and to be paid the Charges) as at the date of termination.

Upon the termination of this Agreement:

- the Company will provide such assistance as is reasonably requested by the College to transfer/protect their data from the Software Application. Such cases will be considered as a request for change and are chargeable in applicable cases.
- the College will be entitled to a refund of any Charges paid by them to the Company in respect of any Services which were to be performed after the date of effective termination, and will be released from any obligation to pay such Charges to the Company (such amount to be calculated by the Company using any reasonable methodology).

14. General

Any notice given under this Agreement must be in writing (whether or not described as "written notice" in this Agreement) and must be delivered personally, sent by recorded signed-for post, or sent by email, for the attention of the relevant person, and to the relevant address, or email address given below (or as notified by one party to the other in accordance with this Clause).

Company

Contact Person	:	Mr. Nibin Sunny, Manager - Operations
Company Address	:	ipsr solutions ltd, Kottayam, Kerala - 686 001
Email Address	:	qnsmart@ipsrsolutions.com
Contact Number	:	+919496401306

College

Contact Person : Dr. (Sr.) Gertrude Mary Nirmala S
College Address : Auxilium College, Gandhi Nagar, Vellore,
Tamil Nadu 632 006, India
Email Address : office@auxiliumcollege.edu.in
Contact Number : +919442070170

No breach of any provision of this Agreement will be waived except with the express written consent of the party not in breach

If a Clause of this Agreement is determined by any court or other competent authority to be unlawful and/or unenforceable, the other Clauses of this Agreement will continue in effect. If any unlawful and/or unenforceable Clause would be lawful or enforceable if part of it were deleted, that part will be deemed to be deleted, and the rest of the Clause will continue in effect (unless that would contradict the clear intention of the parties, in which case the entirety of the relevant Clause will be deemed to be deleted).

This Agreement may not be varied except:

- a) through the Change control procedure mentioned in the agreement or
- b) by a written document signed by or on behalf of each of the parties.

The Company may subcontract any of its obligations under this Agreement to any third party without obtaining the College's prior written consent. But the company shall be solely responsible to ensure Confidentiality and other assurances to the College, as outlined in different Clauses of this agreement.

Each party agrees to execute (and arrange for the execution of) any documents and do (and arrange for the doing of) any things reasonably within that party's power, which are necessary to enable the parties to exercise their rights and fulfill their obligations under this Agreement.

This Agreement constitutes the entire agreement and understanding of the parties in relation to the subject matter of this Agreement, and supersedes all previous agreements, arrangements and understandings between the parties relating to the subject matter of this Agreement if there any.

This Agreement will be governed by and construed in accordance with the laws of India and the courts of Kerala will have exclusive jurisdiction to adjudicate any dispute arising under or in connection with this Agreement.

This agreement may be executed in one or more counterparts each of which shall be deemed an original. Photostat/scanned copy of the duly executed agreement shall be

deemed an original and all of which taken together shall constitute one and the same agreement.

The parties have indicated their acceptance of this Agreement by executing it below.

EXECUTION:

ipsr solutions ltd , Kottayam, Kerala SIGNED by Mr. Nibin Sunny Date: 10 January 2020	Witness. SIGNED by Mr. Bilal J Date: 10 January 2020
Auxilium College (Autonomous) , Gandhi Nagar, Vellore, Tamil Nadu 632 006, India SIGNED by Date: 10 January 2020	Witness. SIGNED by Date: 10 January 2020

EXHIBIT B

Statement of Work (SoW)

Project Name : Implementation of QnSmart

Provider : ipsr solutions ltd, Kottayam, Kerala, India

Client : Auxilium College, Gandhi Nagar, Vellore, Tamil Nadu 632 006

1. Introduction

The Client - Auxilium College, Gandhi Nagar, Vellore, Tamil Nadu 632 006, India is an autonomous college for women, affiliated to the Thiruvalluvar University, Vellore, India. Being an autonomous institution, the College is responsible to conduct different examinations. Question paper generation for these examinations need to adhere to various quality and regulatory standards. Also, some of these question papers are not allowed to be created by the internal faculty, which requires the involvement of external experts and henceforth an increase in the academic expenses.

QnSmart by Ipar solutions ltd, Kottayam, is a web based software solution which addresses the question paper related issues of academic institutions, by allowing them to maintain structured and standardised question banks for each course. QnSmart also allows for generating question papers based on customisable rules and templates.

2. Scope of Work

This project will provide necessary licenses of QnSmart, as required by the different Programmes run by the College as well as install and implement the software application in the College premises.

Staff of the college will be given relevant user training through Workshops/Seminars, which will help them understand the academic philosophy powering the software application as well as the usage of the software interfaces and functionality.

1 year of warranty support will also be provided to the College, after the date of installation.

3. Period of Performance

The period of performance for QnSmart Implementation Project is **30 days** beginning on **10th January 2020** through **08th February 2020**. All work must be scheduled to complete within this timeframe.

Any modifications or extensions beyond the specifications under this SoW will be requested through Change Control procedures stipulated and may extend the period of performance.

The warranty support will begin on the **11th February 2020**

4. Place of Performance

The Company will perform the majority of the work at its own facility.

The College will provide and arrange for meeting spaces within its facility for all required meetings.

The College will also provide hosting environments as specified in this SoW, in a timely fashion.

The installation and ongoing support may happen locally at the College premises or through remote access, as required by the company.

Once the project reaches the training phase, all training will be conducted at the College premises.

5. Software Application Specifications

QnSmart is a web based software application that facilitates smart question bank management as well as efficient question paper generation.

Following are the functionalities available in the software:

5.1. Role Based Access

- User Access controlled with login id and password
- Users created by the Administrator
- Same user may be assigned multiple roles
- Following are the different roles available:
 - ❑ Administrator: Performs administrative tasks in QnSmart
 - ❑ CoE: Controller of Examinations
 - ❑ HoD: Head of Department
 - ❑ HoD Assistant: Performs Department related QnSmart administration; Assigned by HoD.
 - ❑ Faculty: Manages syllabus and question banks of Courses
 - ❑ Student Assistant: Performs question entry when assigned by Administrator

5.2. Programme Creation

The various Programmes supported in the Software Application will be pre-configured by the Company, based on the licensing.

5.3. Course Creation

Different Courses in each Programme are created and Faculty assigned by the CoE

5.4. Syllabus Creation

By the Faculty assigned in each course.

If multiple faculty are handling the same subject, only one among them will be provided with Syllabus entry rights.

Each Course Syllabus may contain 1-15 Modules.

Each Module is divided into minute level Units. The concept of Units should be such that in a Question Paper, there will be only one question from a Unit

5.5. Blueprint

The Blueprint for a Course will be updated by the Faculty.

Blueprint is a plan on the weightage of different modules in the Syllabus, in the Question Paper.

Please find below, a sample BluePrint.

Module	Section A 10/10	Section B 8/12	Section C 6/9	Section D 2/4
Module 1	2	3	2	1
Module 2	2	2	2	0
Module 3	2	2	1	1
Module 4	2	2	2	1
Module 5	2	3	2	1
	10	12	9	4

5.6. Question Paper Pattern

Question Paper pattern for a course will be updated by the concerned Faculty. It is an outline plan on the different sections of the Question Paper, number of questions in each section and marks for each section.

There are 04 (four) question paper patterns suggested by the College for semester end examinations.

5.7. Question Bank Creation

Question Bank for a Course is the collection of all questions related to a Course. This will be added/maintained by the concerned Faculty.

If two or more Faculty are handling the same subject, all faculty will be provided with Question Entry rights. Questions Entered by one Faculty cannot be altered by another; but it may be viewed by others.

CoE can control the time limits allowed to Faculty for entering questions to questions bank. Normally time limits are set commonly based on year wise admission. It will be separate for PG programmes and UG programmes.

Questions of type Text can be uploaded using an MS Excel file - .xlsx extension only, in the prescribed format. Questions for different Parts in the Question Template should be added as separate sheets in Excel file.

Question with tables, figures should be entered directly through the QnSmart interface.

For entering mathematical or scientific notations like matrix, calculus related formulae etc QnSmart uses an Open Source editor called VisualMath Editor. Using this editor, formulae and notation can be downloaded as image. This image should be uploaded in QnSmart and used in the Question text.

There will be provision for uploading questions as images and for Direct copy/paste option from MS Word or any standard editor. Faculty is expected to cross check the alignment of the pasted text with MS Word or any other standard editor.

Each question will have the Question Text, Answer Key and Placeholder for questions along with classification parameters such as Bloom's Taxonomy, Difficulty level, Question type and Importance level

All the image based questions are expected to be uploaded to the domain or subdomain provided by the College, to be used for QnSmart implementation. It is not recommended to use images hosted on external sites. Image types which are not available in VisualMath Editor, are expected to be created by concerned Faculty and uploaded to the server.

Answer Key shall be optional for all Questions.

Placeholder for Questions are optional

Each Question needs to be classified based on:

- Bloom's taxonomy
 - Remember
 - Understand
 - Apply
 - Analyze
 - Create
 - Evaluate
- Difficulty level
 - Easy
 - Medium
 - Challenging
- Importance level
 - Very Important

- Important
- Normal
- Question Type
 - Theory
 - Application

Faculty may add new questions in to the existing question bank, while they have rights for the same.

They may also request for access rights to migrate questions from other courses into their own. An advised process is that the Faculty makes a request to the HoD and he/she escalates it to the Administrator for action.

Since maintaining history is essential for avoiding repetition of questions, when same questions are used in new Syllabus, it is mandatory to migrate questions from the previous year Question Bank and not add afresh. Otherwise, this will be treated as a different question and not considered for repetition.

It is the responsibility of the Faculty to verify sufficiency of questions for Question Paper generation, using the options provided.

Faculty will also be responsible for the alignment of questions entered.

5.8. Question Bank Status

HOD can view and verify the Question Bank status of each Course in the current semester.

It is the responsibility of HoD to ensure that Question Banks are uploaded by Faculty on time.

There will also be periodic automatic notifications - Email Notifications and Dashboard Notifications - about Question Bank Health, which is basically Question Bank sufficiency, based on the Question Paper patterns, Blueprint etc.

5.9. Question Bank Download

HOD Assistant is responsible for downloading Question Bank from QnSmart, and make it available to students through convenient methods.

HOD Assistant may also download Question Bank for review by experts.

5.10. Question Paper Generation

Question Paper is expected to printed on A4 or A3 sized papers.

Question Paper will be downloaded as HTML file.

There will be facilities for editing generated Question Paper just before printing.

If specific Header/Footer need to be set (Question Paper Code, Page Numbers etc) or Margins, Alignment, Pagination etc need to be altered, the downloaded HTML file needs to be opened as an Online Google Doc (which provides better editing options on HTML files than local document editors like MS Word or Openoffice). If required, this may be done by an assistant of CoE who may be familiar with such tasks.

The history of questions selected for each question paper generation will be stored in the Software Application, for up to the past 5 Question Papers. CoE can set a percentage of repeated questions allowed in a new Question Paper. The default shall be 30%, meaning that not more than 30% of questions in a new Question Paper would have been asked in the past 5 Question Papers generated from the application.

Generation of question papers consider weightage of each module as decided by Blueprint entered by the Faculty.

In a Question Paper, there will be only and one question question from a unit. Once a question is selected from a Unit, no other questions from that Unit will be included in same question paper.

While generating the question paper, CoE's/HoD Assistant's machine should have internet connection.

5.10.1. Internal Exams

HoD Assistant will be responsible for generating internal exam question papers for the Department.

Relevant Modules/Units may be selected for Internal Exams

While generating question paper for Internal Exams, the Blueprint may not be applicable. A weightage pattern based on question count in the selected Modules will be applied which choosing the questions.

5.10.2. Model/Final Exams

CoE will be responsible for generating question paper for Semester End Examination and Model Examination

Bloom's Taxonomy criteria, Difficulty level, Importance level and Question type criteria may be chosen for Question Paper generation.

Question sufficiency for the Question Paper criteria selected can be reviewed by CoE before generating the Question Paper.

5.10.3. OBE Enabling

Under OBE, all the questions in the Semester End Examination need to be individually mapped to different Course Outcomes (COs).

For this purpose, following additional features shall be available in OBE Enabled QnSmart.

- ◆ Option for Teacher with Syllabus rights to add Course Outcomes.
- ◆ Once the required Questions are added in the question bank, the teacher can download the questions in an excel file and to map them to relevant Course Outcomes along with the strength against attainment scale.
- ◆ While the CoE generates a Question Paper, there will be an additional option to download the CO mappings for the question paper.

6. Technology

The QnSmart Software Application has been built using the following technologies

- JSF 2.2 with Primeface 6.0
- Builder Tool : Maven
- Version Tool : Git
- Database : MySQL

7. Design Elements

Front-end design uses Bootstrap and HTML5, component for rich user experience.

8. Server environment

The server environment will be maintained by the College, locally at the College premises. College should be responsible to provide a static IP and domain name or subdomain. This subdomain will be the url for software .

Specifications

- 2.4 GHz Quad Core processor or above
- 8GB RAM or above with 2133MHz recommended
- Internet Connectivity with at least 2 Mbps recommended (1 : 1)
- Static IP - 01 Nos
- OS : CentOS 7+
- Kernel version: 3.10 or above
- Java 1.8 or above

- Tomcat 8.0.27 (exact version required)
- MySQL 5.7 or above / MariaDB 10.1 or above

Backups and Maintenance

- The Server maintenance and backups need to be done by the College
- Backup process for the QnSmart application will be configured by the Company, as cron job in Server. The College's needs to ensure that cron job is running and the backups are safely stored.

9. Browser and Device compatibility

The application shall be compatible to work on laptops and desktops with the following OS/Browsers.

Windows 8/10

- Chrome 70 upwards, (recommended)
- Firefox 62 upwards

Linux (Fedora 26+)

- Chrome 70 upwards (recommended)
- Firefox 62 upwards

10. Third Party Works

Following Third Party Works have been used in the QnSmart Software Application:

- CKEditor (Open Source)
- VisualMathEditor (Open Source)

11. Customer Works

No specific Customer Works have been used in this version of QnSmart, other than the logo or imagery provided by the College.

12. Non Functional Specifications

Usability

The QnSmart application is designed to be used by members of an academic community, who are expected to have basic savviness in using browser-based applications. While the

user interfaces may work on mobile or handheld devices, UIs are not specifically designed to be responsive.

Security

The QnSmart application functions based on standard security parameters such as authentication and authorization. Communication between client and server are done through http protocol. It is recommended to purchase and install an SSL, to use https protocol and enable TLS encryption.

Performance & Scalability

The QnSmart application is expected to support 50-80 concurrent users on a Server with minimum hardware requirements specified above. To support more users, server configuration may be enhanced.

13. Implementation Support

13.1. User Training

Following user training sessions will be offered at the customer premises or via online, based on mutual agreement.

Training Session	Duration
Training to CoE office	0.5 day
Initial Training Workshop for teachers (prior to initial question entry)	1 day
Remedial Training Workshop for teachers (during initial question entry)	1 day
Validation Workshop for teachers (after initial question entry)	1 day

13.2. Ongoing User Support

After the initial user training, individual users may avail telephonic support during the business hours. The support contact number shall be shared directly with the contact person at the college, who may share it with other users.

14. Project Time schedules

Following are the Import Project Milestones:

Activity	Completion Date
Signing of the Agreement	10th January 2020
Initial User Training	17th January 2020
Initial Installation for Question Entry	17th January 2020
Finish the Implementation	10th February 2020
Beginning of Warranty	11th February 2020
End of Warranty	10th February 2021

*** End of Document ***