

# INTRODUCING TALEEM – A SYSTEM OF ICT SUPPORTED COURSE MANAGEMENT FOR QUALITY EDUCATION IN CBSE SCHOOLS

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April 2013

PAPER SUMMARY SUBMITTED FOR THE

7<sup>th</sup> PAN COMMONWEALTH FORUM ON OPEN LEARNING PCF-7

Under the theme Innovation and Technology

## 1. BACKGROUND TO TALEEM FOR CBSE

The Central Board of Secondary Education (CBSE) is the premier school education board of the Govt. Of India. There are more than 13,500 schools across India that run the CBSE curricula in the K-12 range. CBSE guides the publishing of the textbooks, issues a many guidelines for its schools and their teachers on teaching methodologies, school management, assessment guidelines and teachers training. CBSE has fairly comprehensive quality assurance system that is backed by its Research, Academics and Training wings. It conducts regular capacity building workshops and conferences for school teachers and school management persons throughout India. Further CBSE has a strong academics research division that publishes many guidelines and best practices for guiding the schools and their teachers.

Now CBSE is working to provide an active system of Information-Communication Technology (ICT) enabled support for teachers and management persons in all its schools. This is challenging task considering that its schools are set over a culturally and linguistically diverse regions of India. To make this happen, CBSE is planning to leverage on the 'Sahodaya' system of clustering schools in the different regions. The CBSE Sahodaya (visit: <http://www.sahodayaschools.org/> ) concept encourages schools affiliated to CBSE in the different regions form local clusters to help each other in several ways. To bring in effective ICT enabled educational guidance and enhanced quality of education in these schools, CBSE proposes to introduce the 'TALEEM' (for 'Technology Augmented Learning and Education Environment Management') pioneered by the first author in other educational settings. The proposed system of TALEEM is an adaptation of earlier initiatives of the Kerala Education Grid [1] and the ODTEL (for 'Open Distributed Technology Enhanced Learning') [2] pioneered in IGNOU. ODTEL was presented in the Pan Commonealth Forum PCF 6 that was held at Cochin in India.

This paper presents the TALEEM system as it is proposed for CBSE to enhance the quality of education and management of courses across all the schools affiliated to the CBSE. The proposals here are in the development stage and being implemented by the Chinmaya Institute of Technology with its neighbouring Chinmaya Vidyalay, Kannur in North Kerala region providing the initial deployment and proving ground. The teachers in some of the CBSE schools of North Kerala region are being involved in its implementation.

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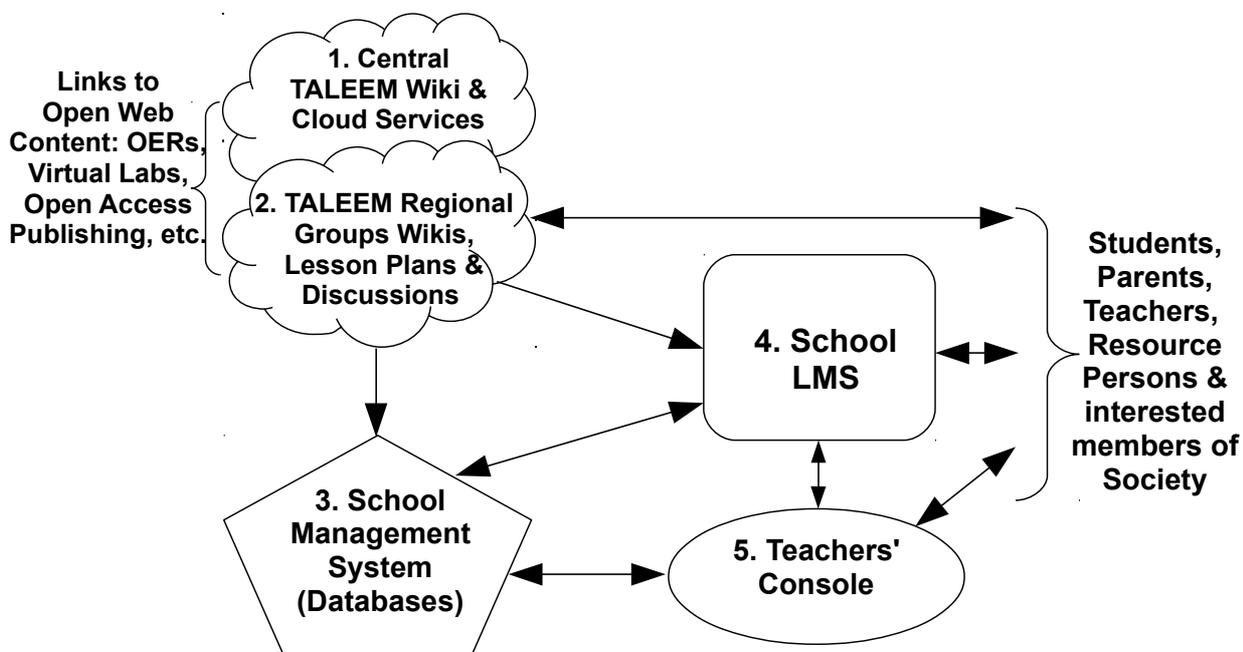
**About the authors:** <sup>1</sup>Prof. K.R. Srivathsan is the Director of the Chinmaya Institute of Technology. Earlier he was Pro-Vice Chancellor of IGNOU. He is Professor (Retd.) from IIT Kanpur and was the first Director of the Indian Institute of Information Technology and Management, Kerala. <sup>2</sup>Vineet Joshi, IAS is the current Chairman of CBSE. <sup>3</sup>Dr. Sadhana Parashar is the Director (Academics and Training) of the CBSE. <sup>4</sup>Mm. Sugeeta Rajan is the Principal of the Chinmaya Vidyalaya, Kannur – a CBSE school whose teachers are participating in the TALEEM trials.

## 2. THE TALEEM METHODOLOGY

TALEEM for CBSE assumes a community driven education collaboration. The community here consists of the teachers and the students of the CBSE schools in a Sahodaya cluster. It may also be a group of neighbourhood Sahodayas may constitute one TALEEM community. The parents and guardians of the students too may participate in the TALEEM facilitated discussions. Next we group the teachers across the schools class wise and subject wise. For example, all Class IX Science teachers may constitute a functional TALEEM Group. If a teacher is involved in multiple subjects, then she/he may be a member of in each of the subject groups. In addition to this, TALEEM has to meet the following requirements.

- i. Each school is autonomous. Each teacher in the school has the autonomy to engage her/his students in the study and assessment activities.
- ii. Though each school sets up its own calendar for the classes, broadly it conforms to the overall semester schedules recommended by the CBSE.
- iii. The teachers follow the CBSE guidelines both with regard to the syllabus of the course and also the recommended formative and summative assessment schemes.
- iv. Each school maintains its own students records and related databases. Each teacher in the school manages the monitoring and interactions with her/his students and their parents.
- v. The IVT facilitated system shall also assist in the teachers continuing education and training in TALEEM related methodologies.
- vi. Each Sahodaya, or, groups of Sahodayas in a geographic region (we refer to them as TALEEM Regional Group) functions autonomously, but follows the broad guidelines on

Based upon the above broad parameters of requirements, we are implementing TALEEM as illustrated in Fig. 1 below.



**Fig. 1: Component Systems for TALEEM**

The roles of the different component systems of TALEEM are briefly explained next.

**2.1.1. Central TALEEM Wiki & Cloud Services:** These are maintained by the CBSE and its content is shared by all the Sahodayas and their schools. CBSE may offer cloud hosting services to interested schools or to host centrally conducted training programs for teachers, staffs and others as it desires. The TALEEM Wiki hosts the reference **TALEEM Course Plan (TCP)** and associated **TALEEM Lesson Plans (TLP)** for the units of study associated with the course for all CBSE courses conducted in the schools. The TCP is structured as the home area of the concerned course while the TLPs detail the pedagogically structured lesson plans for each unit and its topics. The format of the two are illustrated in the box diagrams of Figs. 2 and 3 respectively.

**2.1.2. TALEEM Regional Groups Wikis & Discussions:** Each Regional Group of schools maintains its own course and lesson plans aligned with the Central TALEEM Wiki for the courses offered in the different classes. We may also call them as Sahodaya Wikis. The course and lesson plans in the Regional Wikis have localized examples and associated content as suited to local language, knowledge and culture. The two layers are wikis – the central and regional are essential to tackle the large diversity of languages and culture in a country like India. The regional content is maintained by small groups of local Subject Matter Experts and experienced local teachers.

Associated with the Wikis are open discussion forums. The regional discussion forums will also have local language support. We may note that there are two levels of discussion forums. One is the open general discussions maintained at the regional TALEEM portal and the other the TCP and TLPs associated wiki discussion forums. The latter is restricted to discussions on associated subject matter by the teachers and those who wish to contribute it.

Both the two layers of wikis cater as references to all the schools. The other three component systems of TALEEM as illustrated in Fig. 1 are schools specific instruments to manage the e-learning related activities. These are described in the next section.

### **3. MANAGEMENT OF E-LEARNING IN THE SCHOOLS**

There are two possible scenarios of e-learning management in the schools. One is to assume that over the next few years all students will have a reasonable priced tablets with adequate performance. However assuming Internet at homes is not that realistic as its penetration and reliability is still weak in India. A second and more realistic possibility is to assume that the schools will have acceptable quality Internet and equipped with managed LAN and Wifi hotspots in its premises. The challenge is to have these well managed with good uptime and performance assurance. We propose that each school employs well qualified and trained IT graduate. We propose to launch a Postgraduate Program in E-Learning Management at the Chinmaya Institute of Technology to train such graduates and propagate this program for offering across India. We shall focus on schools hosting Internet access and providing WiFi access. Yet another route for reaching e-learning services to homes is to promote Internet access through IP-TV. With 1500 cities and towns in India now promoting Digital Set Top Boxes, this is feasible.

To manage e-learning, we shall assume that teachers are equipped with tablets. Students too may bring their own tablets as is likely for those from middle income groups. With this background we shall look the TALEEM components illustrated in Fig. 1.

**3.1. School Management System:** Every school needs some kind of database and ERP system for managing its students and employee records, scheduling of events, etc. In our implementation we are configuring the popular FOSS application called Fedena [ ]. This is used in over 40,000 schools for their management. In addition we are implementing GNUKatha [ ], a FOSS distribution of accounting package that is getting widely accepted now. The students records in Fedena are used to

derive class-wise registration records of students. This in turn is used to configure the popular Learning Management System, Moodle.

**3.2. School LMS:** The globally popular Moodle is used as the Learning Management System (LMS). This is particularly useful in managing online tests. This assumes that students in the school have a computer lab to do such online exercises. With some development we may post online tests to be done via tablets as well. Other standard functions of the LMS are also useful. We may encourage students participation in closed class discussions, submit assignments online, share multimedia documents, etc.

In addition we use one shared LMS at the TALEEM Regional Group level exclusively for teachers to be trained in e-learning and understanding the application of TCP and TLPs in the conduct of the courses.

**3.3. Teachers Console:** While conducting a course over a typical semester long duration, teachers in the class often have to manage several events. Further the students or their parents may like to interact with the school and the concerned teacher. Towards this we are developing an interactive web portal area for each course that will be deployed at the school level. We refer to this portal as teachers' console. By logging into this area, teachers may send alerts in the form of email or SMS to mobile phones of the student or her/his parents, post announcements and such kinds of content that may be downloaded like RSS feeds by the students in their tablets, etc.

#### **4. TALEEM COURSE AND LESSON PLANS**

The aim of TALEEM is to provide such education environment using technology, or ICT that serves the following objectives.

- i. We support a pedagogically effective and outcome based educational environment. The pedagogy will be expressed in open published form as TLPs for the units of lessons in the course. Outcome based education implies that the student demonstrably shows the competencies as expressed in the unit and topics instructional objectives. The Course itself will have an overall course objective objective as expressed in the TCP.
- ii. The teacher is better equipped to manage the engagement of the students in the stipulated activities as prescribed in the TLPs.
- iii. In Kindergarten and elementary school classes, teachers will be equipped to engage the parents in the child's learning activities. Towards this the teachers console and alerts system will help.
- iv. Students across the schools in a region will have a strong online social networking that is contextualized for each class and its courses.
- v. Freely available OERs from sources on the web like the Khan Academy, YouTube, Wikipedia, Curriki, Intel K-12, etc. are contextualized as suited in the respective topics and units of a course.
- vi. Teachers and the Schools will be equipped to guide and monitor better study and practice related activities of students outside the class and school hours.
- vii. Schools may introduce innovative study environment like 'Flip-Class' as well as create streaming channels accessed over local TV networks to enhance the quality of engagement of students in their studies.

We may note in a good education system, the students are engaged intensively both in self study and exercises as well as in group related activities. These activities as relevant to specific units and its topics are published in the TLPs. In Figs. 2 and 3 we illustrate the skeletal structure of typical TCP and TLP.

<b>Course Code &amp; Title: XXX CBSE Class IX Science</b> <span style="float: right;"><b>Status:</b></span> <b>School/Region with Code:</b> <b>Course Experts:</b>	
<a href="#">Class IX Home</a>   <a href="#">Course LMS</a>   <a href="#">Discussions</a>   <a href="#">Query</a>   <a href="#">FAQ</a>   <a href="#">Directory</a>	
<b>Contents</b>	<b>Announcements</b>
<b>About the Course:</b>  <b>Course Objectives:</b>  <b>Course Calendar:</b>  <b>Course Related Instructions</b>	
<b>Course Syllabus stated unit-wise with links to Unit Lesson Plans</b>  <b>Recommended Text Book:</b> <b>Resources: (Links)</b>	

**Fig. 2: Typical Structure of a Course Lesson Plan over the TALEEM Wiki**

We may note the links in the header area of the TCP shown in Fig. 2. While TALEEM Wiki itself is shared by clusters of Sahodaya / regional schools, the actual e-learning activities for students of a class in a school are managed by the respective school teachers using their own LMS or such platforms. The links in the header area enable vectoring the navigation from the open TCP to the class-specific and students to college specific LMS and course related systems. The Directory Course LMS and Query enable students and teachers switch from open TALEEM Wiki area to their respective activities area in the school. In Fig. 3 we illustrate the TALEEM Lesson Plan outline.

<b>Unit Code &amp; Title:</b> <b>Course Code &amp; Title: XXX CBSE Class IX Science</b> <b>School/Region with Code:</b>		<b>Status:</b>
<a href="#">Class IX Home</a>   <a href="#">Course Home</a>   <a href="#">Unit Resources Download</a>   <a href="#">Course LMS</a>   <a href="#">Wiki Discussions</a>		
<b>Contents</b> ..... <b>Topic 1</b> <b>Topic 2</b> .... <b>Topic n</b>	<b>Unit Instructional Objectives</b>	
<b>Topic 1: Topic title</b> <b>Instructional Objectives:</b>  <b>Prerequisites/Preparatory Study:</b>  <b>Class related study materials and resources:</b>  <b>Class Follow up: Worked out Examples, Case Studies, Exercises, Formative Assessment Problems and Activities.</b>		

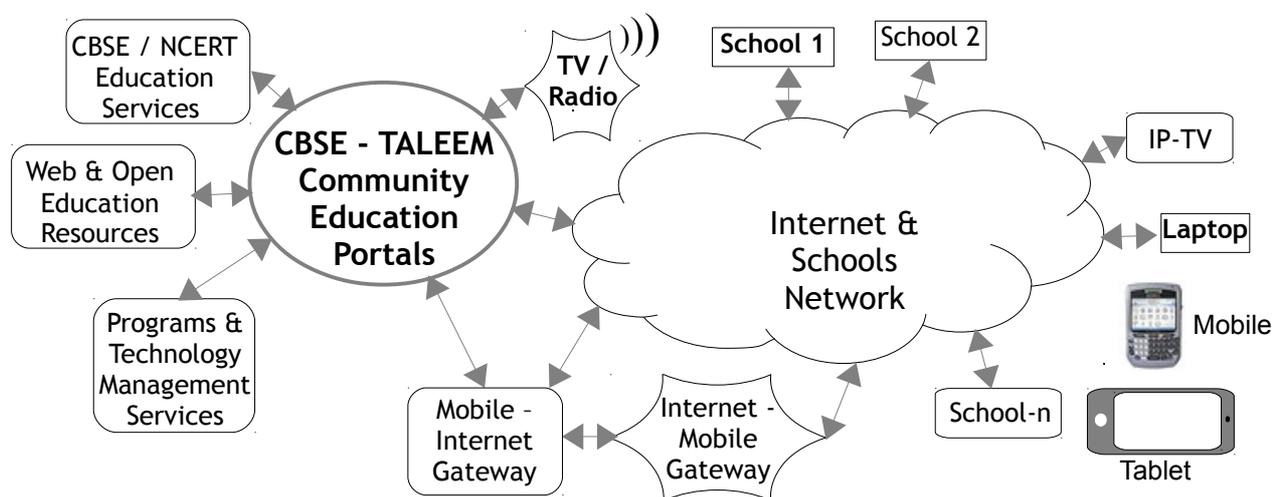
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<b>Topic n: Topic title</b> <b>Instructional Objectives:</b>  <b>Prerequisites/Preparatory Study:</b>  <b>Class related study materials and resources:</b>  <b>Class Follow up: Worked out Examples, Case Studies, Exercises, Formative Assessment Problems and Activities.</b>		
<b>Module Assessment</b> (as part of Continuous and Comprehensive Evaluation - Assessment may use online platforms like LMS, online testing, etc.)  <b>Supplementary Studies: Related Value Education and Real World Applications as deemed suitable Leads to Further Study and activities for motivated students</b>		

**Fig. 3: Typical TALEEM Lesson Plan structure for a unit of study**

TLPs provide the space for designing and expressing the pedagogy as a sequence of learning processes and engagements that are prescribed by Subject Matter Experts Group (SMEG). SMEGs may be constituted by the CBSE at the central level and also by Sahodaya/Regional clusters of schools for the purpose of localization and local teachers training. The basic difference between the now widely available systems of OERs like Khan Academy, Curriki, etc. and TALEEM are worth emphasizing here. TALEEM is a system of managing education in participating schools through their collaboration over the cloud and local educational processes management. In this it may

contextualize and use the OERs available from any source as it deems fit as well as contribute to new OERs and design of educational processes. approved course and unit related study activities and learner engagement processes. It nurtures the autonomy of member schools even as it strengthens the teachers by supporting them through applicable OERs and assisting them in the teaching-learning processes. In this way it actually makes quality education possible in the emerging times of integrated cloud-mobile-social networking – digital media access as illustrated in Fig. 4. below.



**Fig. 1: Network and IT Scenario for Schools Education for TALEEM**

TALEEM does not over-regimentalize the teachers. The teachers may innovate, publish it in the TALEEM discussions which in turn may be incorporated in the following academic year. TALEEM also facilitates the relevant teachers training in practising pedagogically sound processes in such ways that enhances outcome based education. In 2009 CBSE introduced the 'Continuous and Comprehensive Evaluation' (CCE) for Classes IX and X. It issued guidelines on how the teachers should manage the formative and summative assessments. Many schools have difficulties in implementing this as it demands mature and committed teachers. We expect that with TALEEM in place teachers will be in a more comfortable position to manage the CCE.

## 5. OBSERVATIONS AND SUMMARY

TALEEM is essentially an innovation to integrate the availability of quality OERs in the K-12 segment, the increasing penetration of technology, the need for CBSE to support better education with improved monitoring and quality assurance across its vast network of affiliated schools, and bringing the culture of collaborative systems of education across its schools and their teachers. TALEEM will enable CBSE to be ready for the challenges of enabling and empowering its affiliated schools and their teachers for the coming times of the integrated network and media services that is illustrated in Fig. 4 above.

Most of the CBSE schools are not adequately equipped or staffed to manage the TALEEM processes. To overcome this CBSE is considering establishing a 'Sahodaya Institute of Learning and Knowledge' (or, SILK) in every Sahodaya or clusters of about 50 to 100 schools. These institutions will support the schools in managing the ICT systems like those indicated in Fig. 1. They may also serve as training centres and vocational educational programs of the CBSE. They will train the IT

professionals in the schools to service the different systems and applications installed in the schools.

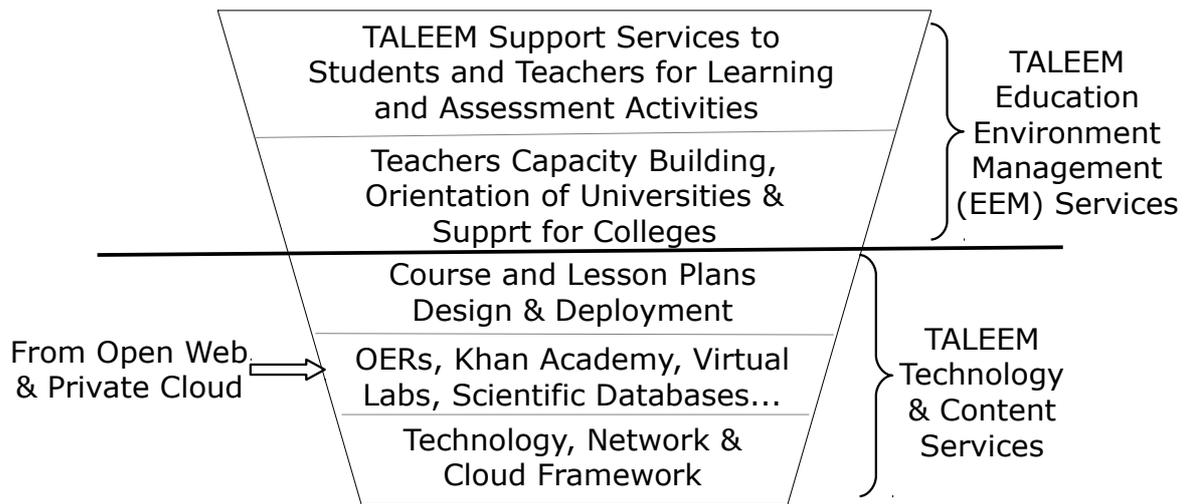
The TALEEM methodology may be adapted to different scenarios – Open Education, Blended and Flexible education to meet the needs of working learners, skills education, the affiliating universities and their colleges as well as premier institutions. It may also support emerging trends like 'Flip-Class', Self-Study groups, and for the training needs of large segments of field workers in various development and services sectors. We are studying how we may bring through TALEEM a system of Open Accreditation for courses up to the design and deployment stages. With such Open Accreditation we shall be in a better position to offer senior students of the classes XI and XII stages to choose mix of both vocational as well as regular higher education preparatory programs that feed into the university programs. Organizations like Commonwealth of Learning (COL) may promote the use of TALEEM for their education and training programs to be adapted and localized for offering in the different COL member countries.

**Acknowledgements:** TALEEM as a methodology collaborative educational systems across schools is an evolution from the first author's earlier works on the Kerala Education at the Indian Institute of Information Technology and Management – Kerala (IIITM-K) and the 'Open Distributed Technology Enhanced Learning' (ODTEL) that was initiated at the Indira Gandhi National Open University'. His long association with the National Program on Technology Enhanced Learning (NPTEL) gave opportunity to develop the core TALEEM concepts. The objective was how to conduct formal courses in clusters of colleges using the e-content created by the academicians under the NPTEL. The request from CBSE to develop a similar system to support enhanced quality of education in its affiliated schools gave the impetus to this paper. The approach presented here was first presented at the 19<sup>th</sup> National Sahodaya Conference hosted by the CBSE in Indore, India during Dec. 2012. The Chinmaya Mission, Kannur is supporting this development. The work is being executed at the Chinmaya Institute of Technology with the Chinmaya Vidyalayas and some of the other CBSE schools of the North Kerala region serving as participants and proving ground.

## Glossary and References

1. CBSE: Central Board of Secondary Education. Visit: [www.cbse.nic.in](http://www.cbse.nic.in)
2. COL: Commonwealth of Learning, Visit [www.col.org](http://www.col.org).
3. Kerala Education Grid: This was a project of inter institutional collaboration over the Internet across some of the universities and institutions of Kerala conducted during 2003 – 2005. The coordination was done by the IIITM-K. Its approach is presented in the paper: K.R. Srivathsan, "Management of Refereed Content Generation and Utilization in Formal Education", Global Journal of Flexible Systems Management, Vol. 4, 2003.
4. IIITM-K: Indian Institute of Information Technology and Management – Kerala is a postgraduate institute set up by the Govt. Of Kerala. Visist: [www.iiitm.ac.in](http://www.iiitm.ac.in)
5. NPTEL: National Program on Technology Enhanced Learning is funded by the Govt. Of India. Under it 100s of Professors in the IITs and IISc are providing content in the form of curriculum oriented video lectures and interactive web content for courses offered \in the engineering colleges. Visit: <http://nptel/iiitm.ac.in/>
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**Fig. 1: Layers of TALEEM Suite of Educational Systems, Processes and Services**