

TEQIP-II (Sub-component 1.2.1)

REVISED ACTION PLAN FOR CENTER OF EXCELLENCE IN KNOWLEDGE ANALYTICS AND ONTOLOGICAL ENGINEERING (KAnOE)

PES Institute of Technology, Bangalore

25 July 2014

The action plan for the KAnOE COE has been revised taking into account the following recommendations of the review committee:

- **Recommendations:**
 - The Centre should interact with and engage in collaboration with more established counterparts in IITs and other institutions and NLP community in India.
 - It should focus on only one/two problems to make an impact and publish in good journals and conferences
 - The project is recommended for continuing

Please Note: *All plans related to international collaboration and some plans related to publishing have been affected significantly by the unexpected and prolonged ban on international travel imposed by the SPFU/Government of Karnataka. It is still not clear when this ban will be lifted.*

The detailed Revised Action Plan for the KAnOE COE (modified from the original Action Plan) is provided below. The main changes made in view of the above recommendations are:

- Collaboration with established institutions especially the NLP community will be strengthened by joining consortium research in this area with the following organizations: CDAC-Bangalore and Central University-Hyderabad. In addition, collaboration with IIT-Bombay and IIIT-Bangalore will also be explored.
- Focusing on one/two problems to make an impact and publish will be implemented by focusing on the following two problems:
 - Creation and publishing of India-specific Linked Open Datasets and applications based on them;
 - Development of a theoretical model as well as a toolkit for Knowledge Analytics.

It may be noted that in addition to the above two items, the work on developing large-scale ontologies in the mechanical engineering domain is in an advanced stage. The mechanical engineering team will continue independently to find ways of applying and publishing this work while its student team completes the development of the ontologies for Heat Exchangers and Mechanical Mechanisms.

Further, in order to focus strongly on the chosen research problems, the frequency of conducting workshops and training programmes will be reduced. The series of frequent workshops conducted in the first year has served its purpose of establishing and branding the COE initially to create awareness and attract high quality students and researchers to the Centre. It is not of primary importance in the second and subsequent years.

Detailed Action Plan (Modified):

<p align="center">Action Item <i>What Will Be Done?</i></p>	<p align="center">Status <i>When</i></p>
<p>Establishment of CoE</p> <ul style="list-style-type: none"> • Identify location and obtain infrastructure from the college • Put together core team • Hire research staff • Hire administrative assistant • Set up Web site • Hold regular meetings of core team from collaborating departments for sharing of technical know-how, discussing of how problems can be formalized, solutions can be designed and implemented • Enrolment of students under Masters/Doctoral Programs in the area of knowledge analytics and ontological engineering • Domain Study <ul style="list-style-type: none"> • Domain of Mechanical Engineering • Domain of Indian Traditions • Other domains 	<p align="center">Done</p> <p align="center">Done Done Done Done</p> <p align="center">Ongoing bi-weekly</p> <p align="center">Ongoing/Continuing</p> <p align="center">Done Done Ongoing</p>
<p>Conduction of Research</p> <ul style="list-style-type: none"> • Conduct a study on current developments in the area of “Knowledge Analytics” • Explore how intersection of knowledge analytics and ontological engineering can bring new trends in Knowledge Management and Semantic Web • Analysis and Design <ul style="list-style-type: none"> • Formulate problem definitions and requirements to effectively design novel approaches to Knowledge Analytics • Formalize new approaches to Knowledge Management and Semantic Web as a result of exploratory research 	<p align="center">Continuing</p> <p align="center">Ongoing</p> <p align="center">Ongoing</p> <p align="center">Planned</p>

<p>in intersection of the two areas of knowledge analytics and ontological engineering</p> <ul style="list-style-type: none"> • Design new representation structure for knowledge to facilitate effective analytics, management and evaluation of knowledge • Formal reviews of design • Applications <p>Build open source intelligent systems or applications using the new formalized approaches</p> <ul style="list-style-type: none"> • An application to model, analyze mechanical engineering product catalogues, dependencies and compatibilities • A framework for preserving and promoting traditional knowledge of India • An application to support e-teaching and e-learning in Indian schools in Indian vernacular languages • An application to benefit the Indian IT Industry 	<p>Ongoing</p> <p>Planned Ongoing</p> <p>Prototype ready</p> <p>Being developed</p> <p>Prototype ready</p> <p>Planned</p>
<p>Collaborative research across institutions</p> <ul style="list-style-type: none"> • Faculty Exchange Program <ul style="list-style-type: none"> ○ Carry out research at collaborating institutions ○ Prepare reports on the research done and experiences gained ○ Share the reports online for easy access by all the stake holders • Student Exchange Program <ul style="list-style-type: none"> ○ Carry out research at collaborating institutions ○ Jointly design and build intelligent systems to analyze, manage and evaluate knowledge 	<p>MOU signed with Dalhousie University, Halifax, Nova Scotia, Canada.</p> <p>On-Hold due to travel ban.</p> <p>Discussions with University of Maryland, College Park, USA.</p>
<p>Communication of Research Findings</p> <ul style="list-style-type: none"> • Publish research results in International Conferences • Publish novel findings jointly in refereed Journals • Take up study tours to collaborating research centers for more interaction and acquisition of the latest knowledge and technical know-how • • • Events <ul style="list-style-type: none"> • Participate in the Semantic Web Challenge and other competitions in related/aligned areas in global levels • Conduct Annual National Challenge (On 	<p>Ongoing/Continuing</p> <p>Ongoing/Continuing</p> <p>Visited Dalhousie University, Canada and University of Maryland, USA. Return visits by both to PESIT as well.</p> <p>Only entry from India in 2012 at MIT, USA and in 2013 at Sydney, Australia.</p>

<p>the lines of Global Semantic Web Challenge - Billion Triples Challenge) in Knowledge Analytics and Ontological Engineering</p> <ul style="list-style-type: none"> • Faculty Development Programmes <ul style="list-style-type: none"> ○ Analytics in Knowledge Engineering ○ Novel approaches to Knowledge Management/Semantic Web • Workshops <ul style="list-style-type: none"> ○ Ontology Development Methodologies and Tools (In line with Protégé Workshop offered by Stanford University) ○ Emerging Trends in Knowledge Analytics 	<p>Currently being planned.</p> <p>Offered in PESIT, VIT-Chennai, Mumbai University and TERI, Delhi.</p> <p>Series of workshops held successfully.</p> <p>More planned.</p> <p>Planned for 2015.</p> <p>Also participated in the Ontology course conducted by Stanford University, USA in Vienna, Austria.</p>
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