This work is a segment of the product development research as per the guidelines of the mission TDIL (Technology Development of Indian Languages), funded by Ministry of Communication and Information Technology (MCIT), Govt. of India executed at RC-ILTS-Oriya, Post Graduate Department of Computer Science and Application, Utkal University, Bhubaneswar. The main objective of this work is to design a speech synthesizer for Oriya language (one of the official languages of Republic of India). In this piece of work different methods of generation of speech are being discussed for various languages starting from English to many Indian languages including Oriya in detail. The rules for utterance cited by Panini in his worthy work AsthAdhyai are being discussed. As utterance in Oriya language is almost similar to Sanskrit, the rules are well implemented while designing the synthesizer. The technology we have adopted is the concatenation approach and the units chosen are diphones and some triphones. The phoneme database is designed for different context dependent acoustic units. The algorithm takes care of the rules and grammar of the utterance. In some cases allophones of different durations are considered. As cited by ancient Indian phonology rules by two of the PrAtisAkhyas, algorithm is designed. The details of these rules are mentioned in the report. Rule for pitch and intonation are also incorporated to give more naturalness to the output. Rules for prosody are specially taken care of. The concatenation approach provides high quality and naturalness in synthesized speech. The technique like PSOLA and ESNOLA are being applied for both pitch modification and initial phase modification for generating quality sound. Rules like schwa are applied as per the requirement in the system. Automatic unit selection algorithm development is in progress. Interpolation /
decimation method for re-sampling the speech signal has also been integrated. Proper pitch and duration have been modelled at the place of concatenation. This work has been developed in Windows XP environment using C++, Matlab V 6.5 and, MS Visual Studio etc. Matlab is mainly used for the analysis and modelling of the speech signal. The codes and the product is being tested by STQC, Bangalore in different phases and certified satisfactorily by the funding agency. IPR has been obtained for this product from MHRD, Govt. of India. This product is now ready for the use by the common man and especially visually challenged and illiterates. The additional feature in this software is made for reading online newspaper in Oriya. This is being integrated with the Optically Character Recognition (OCR) system and word processor indigenously developed at our organization and the performance is quite satisfactory as tested by the govt. of India agency STQC, Bangalore.

Work for more naturalness is in progress. We are trying to incorporate accent and emotion to the existing TTS. Hopefully a complete machine aided speech synthesizer shall touch the common mass very soon, which will partly fulfil the Vision 2020 of our Honourable President Dr. A.P.J. Abdul Kalam.

(Suman Bhattacharya)