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## Rock Physics and the Shared Earth Model in the 4 ages of Fields: Exploration, Appraisal, Production and Storage

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### Summary

*Rock physics and the shared earth model in the 4 ages of fields:*

*Our increased understanding of the rock physics of reservoirs gives geoscientists the potential to utilize sophisticated modelling and prediction from shared earth models at all stages of the oilfield life-cycle from exploration and appraisal up to real-time reservoir monitoring and geo-storage. This talk will give examples throughout this life-cycle.*

*There is an assumed ‘earth model’ implicit in the work of every subsurface discipline. Seismic interpretation, for instance, is guided by a constantly reviewed mental model. A flow simulation model is a numerical abstraction guided by the engineer’s feeling for the dynamic effects of geological features and rock properties. Sedimentologists and petrophysicists form a geological concept in order to make internally consistent interpretations of well data.*

*Mental models are fuelled by understanding that comes with experience, but currently the industry is short of experienced people. Subsurface teams are overloaded: exploring more remote areas, or deeper and/or in more complex geology; developing more complex and technologically demanding discoveries; and striving to increase recovery factors in existing fields.*

*The demands on professionals of all disciplines can only increase. However, new technology and working methods may be able to supplement mental models born of experience with computer models drawing on accumulated understanding. The inter-dependence of observations and analyses in different disciplines will be inherent to the systems, providing each specialist with the cross-disciplinary vision that leads to reliable interpretations. This will bring the shared earth model forward into a new role, that of obtaining maximum value from the available subsurface data and talent.*