

PREP

Primary resource efficiency by enhanced prediction

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Partners

LTU



Chalmers



Time plan

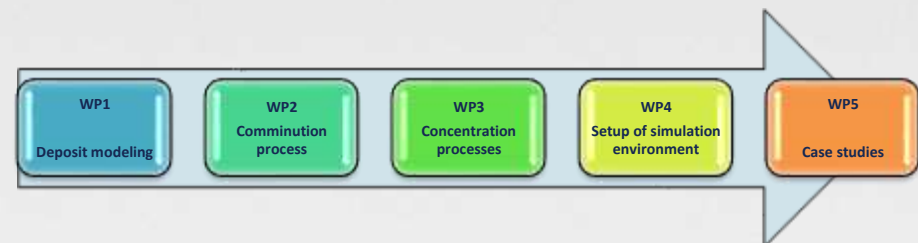
15.6 MSEK

Q4 2014 – Q2 2018



lundin mining

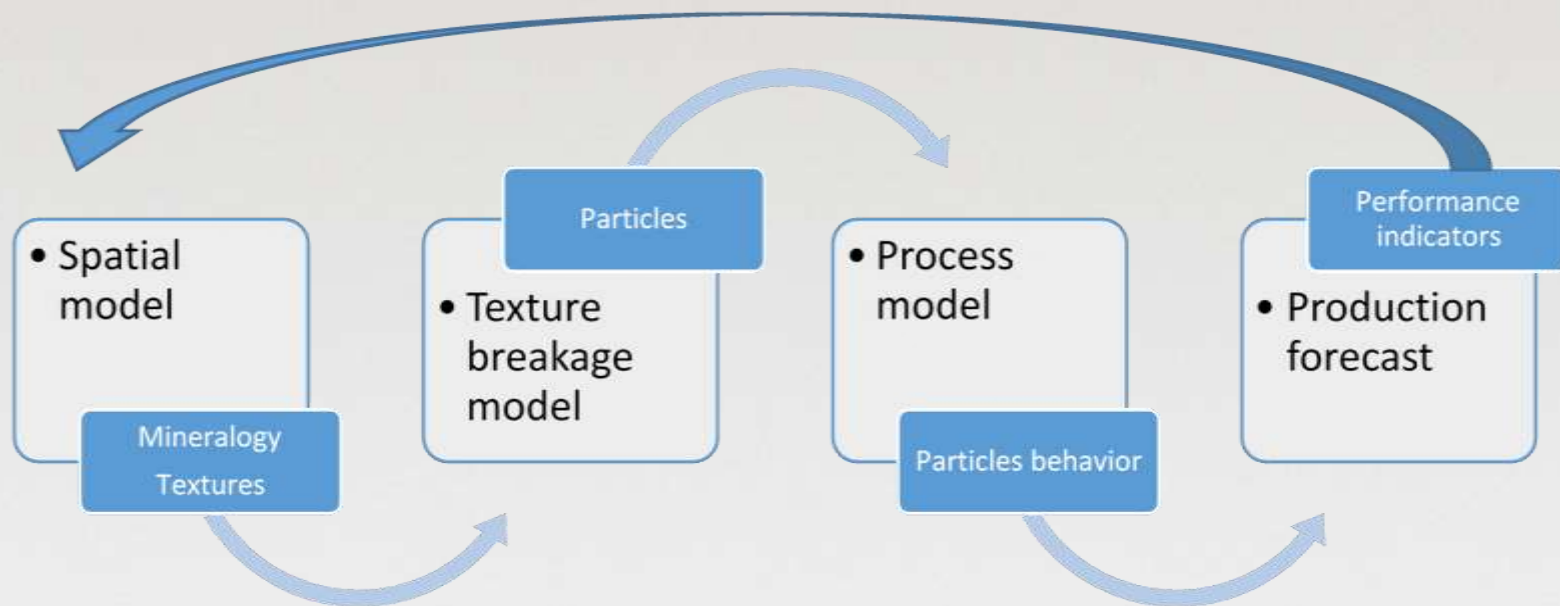
Outotec



SIP | STRIM

Resource effective mineral processing

Aims; - development of an integrated modeling and simulation environment for conducting model-based prognosis for the beneficiation of primary mineral resources



Geometallurgical program

Case studies; Leveäniemi deposit
Aitik deposit
Zinkgruvan deposit

Geometallurgical mapping

Geological
data

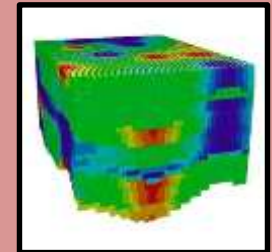
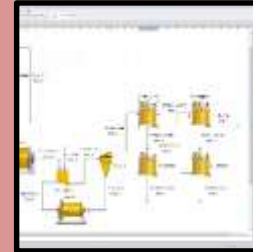
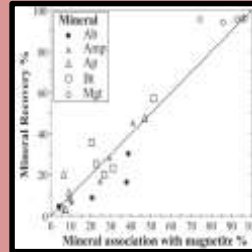
Sampling

Test work

Process
model

Simulation

Geometallurgical
model



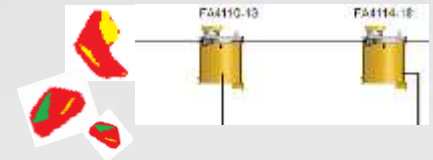
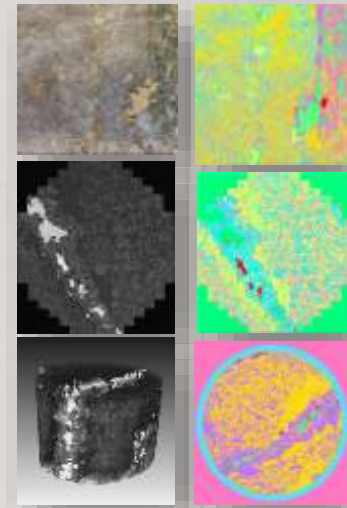
Spatial model

1. Organizing geometallurgical (geological, mineralogical, process data) data in a common structure
2. Developed a geometallurgical proxy tool
 - To be used to forecast and predict metallurgical process parameters (Davis tube tests - predicting Fe-oxides liberation, iron recoveries in WLIMS and classifying iron ore)
3. Developed synthetic modelling environment (modelling and simulation tool) for data integration in mining value chain.
 - To be used for designing sampling strategies, testing different geostatistical (spatial modelling) methods
4. Developed routing for the geometallurgical block modelling
 - To be used when only space and not spatial located process data are available.



Process model

1. Texture characterization (2D and 3D)
2. Automated texture classification
3. Data fusion using geometallurgical variables
4. Simulate breakage
 1. Propagate cracks
 2. Collect particles
 3. Feed particles to the process model
5. Process modelling at liberation level
 1. Flowsheet of connected unit models
 2. Able to predict the concentrate and tailing streams in terms of mineralogy, particle size distribution, water content and degree of liberation



Conclusion

- The academia can develop; approaches, methods, tools, models and guidelines
- Final usage of a geometallurgical program is the implementation, which will be in the industries interest to develop

