

SE Research

What for?

How to do it?

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The Underlying Challenge of Research

- Research is variously understood
- Research discovers new knowledge
- Many systems engineers have a background in engineering or science and continue their view of research from there
- The problem:
 - Useful knowledge is embedded in practical situations – many confounding factors
 - Usual methods for validating knowledge abstract phenomena from their situation
- Most engineering research follows quantitative scientific methods
 - Is this a good thing?



Fields of Knowledge Needed for SE

- SE combines the contributions of various disciplines (engineering and others) to deliver appropriate and effective systems
- This work demands methods which are both:
 - Similar to traditional engineering methods, and
 - Rather different methods
- Research methods need to address the various kinds of knowledge needed to enable activity
- Knowledge fits two forms
 - Know that
 - Know how





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 - Focus of know that is NOT enabling activity
- Know how
 - This kind of knowledge is about enabling activity
 - Know how relies on real knowledge of relevant phenomena situated in their environment



Research Method Choices

- SE research should support practice
- Know that type research is easy to publish
 - Conforms to the framework of scientific knowledge
 - But is not particularly useful in enabling action because it describes things in an abstracted manner
- Know how type research is harder to publish because it is more likely to be situationally relevant (not universal)
 - Therefore appears not to be of broad interest
 - Also less concerned with the development of theories to describe things

