Inside the Tornado...
Risk management...

• Assessment
• Quantify
• Hedge/mitigate
• Control
• Manage
Another risk...

- The System Sisk
- System Risk = the risk inside the system
- System Risk is not technical but behavioral – cultural – psychological

Thordur Vikingur
The history of cost overrun...
Cost-overruns

- Childrens hospital Hringsins = 7%
- Leifsstöd - enlargement = 11%
- Visitors center Vatnajökull = 21%
- Reykjavikur art museum = 28%
- Perlan = 28%
- Thjodmenningarhouse = 30%
- Natturfraedihus U1- Askja = 33%
- Hof - culture center Akureyri = 35%
- OR-husid = 38%
- Reykjavik Radhus = 47%
- Sportstand Laugardalur = 52%
- Office Althingi = 80%
- Thjodarbokladan = 100%
- Sportstand Kopavogur = 149%
- Harpa concert hall = 173%

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The world of risk...

\[
f(x, \mu, \sigma^2) = \frac{1}{\sigma \sqrt{2\pi}} e^{-\frac{(x - \mu)^2}{2\sigma^2}}
\]

\[
\mu = E[X] = \int_{-\infty}^{\infty} x f(x) \, dx
\]

\[
\sigma^2 = V(X) = E[(X - \mu)^2] = \int_{-\infty}^{\infty} (x - \mu)^2 f(x) \, dx
\]

\[
V(X) = E[X^2] - \mu^2 = E[X^2] - (E[X])^2
\]
Two root causes...

- Optimism bias
  - Can be reduced with best practises
- Strategic mis-representation
  - Difficult to handle
  - Outside view
Nefndu fjölda daga sem eru 50%, 75% eða 99% líkur á að þú klárir þetta verkefni

13% 19% 45%
50% 75% 99%
1 2 3

Hlutfall sem höfðu rétt fyrir sér Áætlaðar líkur

Inside view
Outside view

Nefndu fjölda daga sem eru 50%, 75% eða 99% líkur á að pau klári þetta verkefni

- Hlutfall sem höfðu rétt fyrir sér
- Aætlaðar líkur

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Inside the Tornado - Icelandic megaproject

• Typical response to criticism
  - “...there are no arguments for the estimate of a 45% cost overrun in this project”
  - “Yes certainly we stand by this cost projection and we believe it is well conceived“
  - “... and no viable arguments referring to past mistakes stand to refer in context of this project”

Thordur Vikingur
The remedies...

• Transparency
  – Two way communication between the public and government
• Risk Capital
  – Risk must be calculated in monetary values
• Economic Rules
  – Lifetime cost and methods of management
• Performance Specification
  – Value to the public instead of specifications
“Anyone who causes harm by forecasting should be treated as either a fool or a liar. Some forecasters cause more damage to society than criminals”
Nassim Taleb