

THE SCALING FALLACY



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THE SCALING FALLACY

- the assumption that a system that works at one scale will also work at a smaller or larger scale

a normal ant
height approx. 1/2 inch tall
weight approx. 20 mg

can carry 50 times its own weight

50...

a six foot tall ant
weight approx. 200 lbs

6 ft

should be able to lift a bus!

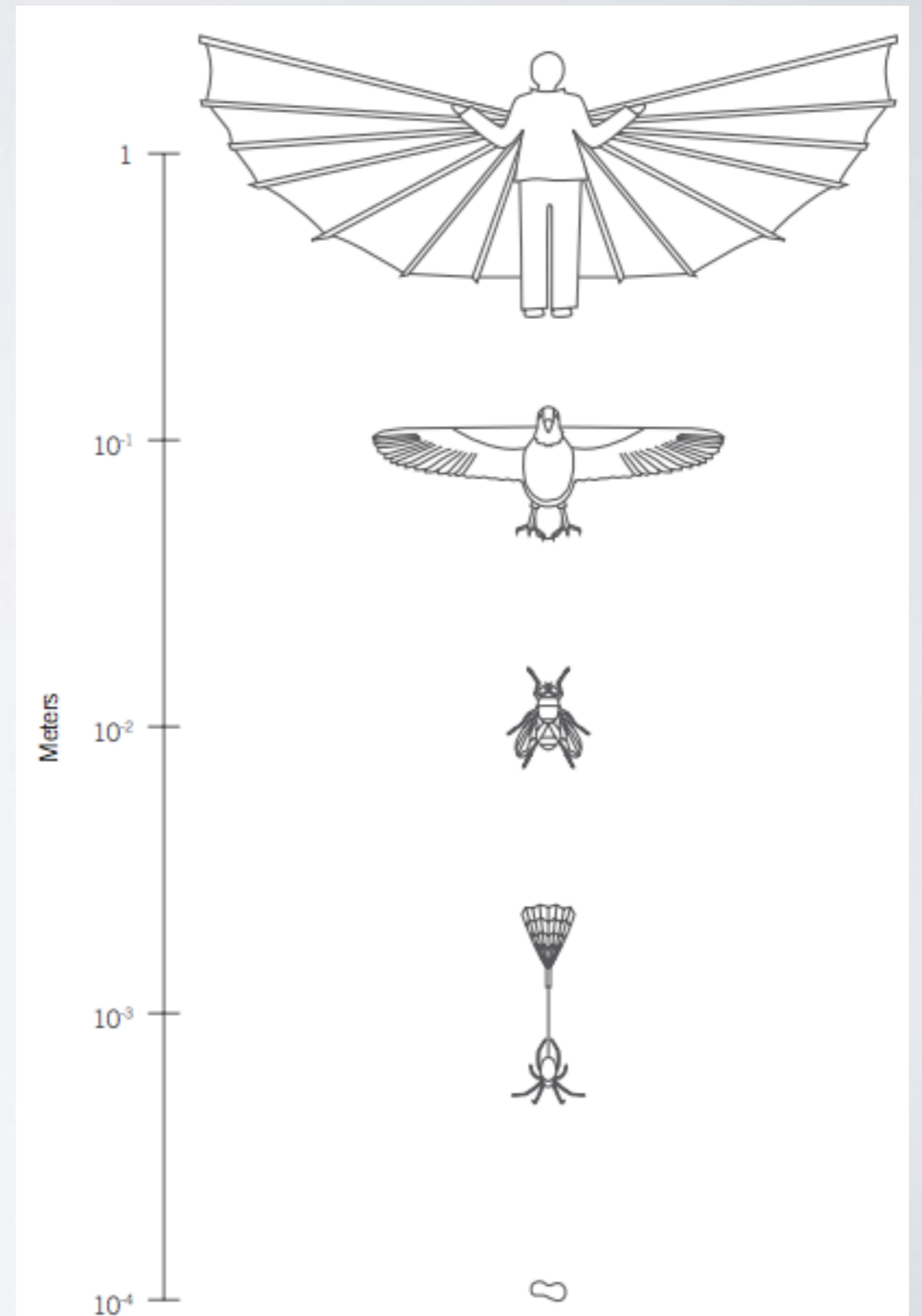
Wrong!

We tend to assume that if something works at one size, that it will work the same if scaled up or down in size. We often neglect to realize that when an object is scaled, the walking stresses on the object do not change at the same scale. Like this ant, objects at small scales are pushed down upon by a minimal amount of gravity. At larger scales, the load of gravity is at full force. So it is a lot easier for a normal ant to carry 50 times its weight than it is for you and me.

Scaling Fallacy
systems can work at one size, and then be completely ineffective at another size

THE SCALING FALLACY

- Flight presents one of the clearest visualizations for this fallacy
- the amount of surface area required for sustained flight increases exponentially as the mass of the flying object increases



EXAMPLES



- Birds wings applied to a human would have to be more than 17 1/2 feet!

IN ACTION

- If your design will need to meet the needs of varied users, make sure it can adjust for their needs
- Growth (or downsizing) of an organization may require reconfiguring of organizational structures, and any systems for said organization
- For visual design sure your design takes into account varied screen sizes (eg. if it will be moved from a smartphone icon to a billboard, it will need to be tested and tweaked to meet the need)
- For back-end design, make sure your design considers the workload of the system...

CHALLENGES



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CHALLENGES

- Hard to know the future scale of a given design
- Other members of your team may not understand the potential for disaster when scaling a design or product
- Simply scaling a design is much cheaper and faster than designing appropriately for the new scale. This can make it hard to sell management on making the investment



"He can play like this, but he'll only be able to give 105%."

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