How Trees Work: The Heart of Storytelling

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Diving deep into some areas of the technology-dependent world where Joe and I work anchors me and gives me the freedom to overreach into areas where I have shallow knowledge depth. The deep roots give me a foundation that supports my ability to reach wide, in the same way that the roots of a tree reach deep to support the trunk, which in turn provides support for the leafy overstory which spreads itself widely across the forest canopy. The canopy spreads wide, leaves touching leaves, branches and twigs interweaving to not only mutually stabilize the trunks below but to also create a vast solar panel that feeds the forest.

In "The Wild Trees," author Richard Preston tells the story of a small group of people who have made it their mission in life to protect the world's largest trees – redwoods and Douglas firs – from clearcut logging. Located in the deep, unknown valleys of the Pacific Northwest, these trees are hundreds of feet tall and spectacular beyond words: Just look at them.

The “charismatic leader” of this band of tree-defending renegades is botanist Steve Sillett, who describes his first trip to the canopy of these trees in the beginning of the book. This was much more than tree-climbing. First, using a crossbow, shoot an arrow over the lowest-most branch, which is itself a hundred feet or more above the forest floor and as thick as a grown man is tall. The arrow pulls a string over the branch which is then used to pull up a heavier line which ultimately pulls up a climbing rope. Using rope ascenders to minimize damage to the tree, climbers make their way to the branch, where they repeat the process, slowly making their way up the trunk of the tree. Rope after rope, ascent after ascent, they make their way to the botanical summit. There they find something they never expected.

Over hundreds, perhaps thousands of years, wind, weather, insects and age have caused deadfalls to accumulate at the canopy of the forest, creating a latticework of debris supported by healthy branches, the whole slowly rotting away to create nutrition for the seeds that fall on the debris pile. Over the centuries the dust from the atmosphere accumulates, scant fractions of a millimeter per year, until today, there is soil – *400 feet above the ground.* Seeds from the air and from passing birds land in the soil and sprout; the coastal fog arrives every day like clockwork, enveloping the canopy in a wet blanket that soaks the soil. Ferns sprout; mosses grow; saplings take root; lichens spread their foliose bodies outward. And before long, healthy branches that support branches that died centuries ago support rich humus below a soil bed that is several feet thick in places – making possible a meadow perched hundreds of feet above the forest floor. And in that new bioclime live insects and amphibians and microscopic creatures that are found nowhere else on earth.

Trees are interesting creatures. In addition to providing support for the canopy it also provides a network of channels that carry water and minerals up from the roots to the leaves in the canopy, and sugar produced by photosynthesis from the leaves down to the branches, trunk, and roots.

The trunk is made up of four distinct layers: the bark, which protects the tree from injury and disease; phloem, which channels food in the form of sugar from the leaves to the rest of the tree; cambium, an exceedingly thin layer (it's only two cells thick) that generates growth in the other layers and makes the trunk of the tree grow thicker; sapwood, also called xylem, the youngest tissue in the trunk and responsible for transporting water and minerals up the tree from the roots to the leaves and other parts of the tree; and finally heartwood, which is old xylem that is dead tissue and provides nothing more than support – although it often rots away, leaving a hollow tree.

But here's the interesting thing. The plumbing in a tree works like plumbing anywhere. Water is carried upward through the xylem in a process called transpiration. Evaporation from the leaves at the top of the tree creates a pressure imbalance that causes water to flow upward from the roots toward the canopy. But at about 100 feet the model breaks down, because at 100 feet the pressure of the water column in the xylem equals atmospheric pressure and the water can't rise any higher – physics is physics. So how does the tree provide water to its highest branches, not to mention the canopy of leaves?

The answer is really interesting. Some of the trees that Sillett and his colleagues are working hard to protect are 300 and 400 feet tall. To get the water they need to survive, they have adapted to the environment in which they live. Instead of depending exclusively on water that is pulled upward from their roots, these trees also pull moisture from the /air itself, absorbing it into the leaf surfaces from the dense, wet fog that rolls in every evening from the ocean.

This is storytelling at its best. Division of labor, adaptation to a changing environment, cooperation and collaboration, all of these are elements of this story. So here's my challenge to you: How could you use this story in an enterprise setting?

Thanks for reading.