OTHER USES OF THE WORD 'SYSTEM'

In systems thinking, the word 'system' refers to a lens, a perspective, a way of looking at something. And comes with a language, and tools. Nothing is a system, anything can be looked at as a system by focusing on elements, relations, feedback, emergent behavior, etc. [L2]

But outside systems thinking, in everyday language, some scientific disciplines, the word is used with a variety of different meanings. It helps to be prepared for that.

Other meanings of **system**:
a large organisation: the legal system, the healthcare system, a system of government, "change the system from within".
a well-organized model: the solar system, the periodic system of chemistry, a system of equations, a coordinate system.
a complex product: computer system, sound system.
a modular product: Lego system, system furniture.

Other meaning of **feedback**:
a single response: user feedback, student feedback.
In system dynamics, feedback is about a loop, and one that works iteratively. There one piece of feedback is not feedback.

The legal system - TUDelft...
tudelft.openresearch.net

IBM Personal System/2 - Wikipedia
nl.wikipedia.org

So what's new? How is a systems view different from a 'traditional' view? An important part is that the established form of science (i.e., most of what you got in school or even university) has been built on the successes of analytic, linear thinking and modelling. The approach: identify elements, divide and conquer: Isolate elements, understand them, and put them together. Identify single causes, test them, and then put the elements together. If there are one or two interactions between the elements, accommodate those.

These were keys to considerable success. As long as scientists stuck to the studying questions they could answer. In the context of systems, feedback cycles, emergent properties, and nonlinear dynamics, these famous methods are shown to be less universally useful than thought before (and probably taught in school).
These differences were explained in comparing 'linear' systems (the ones we understood well) to 'nonlinear' ones (all the rest).

LINEAR ↔ NONLINEAR

LINEAR	NONLINEAR
One chain from cause to effect, in one direction. Stories start at the first cause.	**Multiple paths** of influence, often with competing feedback loops. There is **no privileged starting point** for stories.
Sudden effects are brought about by sudden causes.	Gradual causes can bring about sudden effects.
Elements are more important than relations. What you get out is **proportional** to what you must put in.	**Relations** are more important than elements. At some points, a small improvement requires **ballooning efforts**.
The output is determined by the **input**.	The output is determined by the **structure**. Input variation is absorbed or assimilated.
1 + 1 = 2 (proportional results)	**1 + 1 = 0** (counteracting), **1 + 1 = 1** (saturation), **1 + 1 = 2** (independent), **1 + 1 = 3** (synergy)
The **law of large numbers**: when many things do the same independently, their average is a good predictor.	The **law of middle numbers**: expect regular patterns to last for a while, then change.
With a good model and data, **predictions can go far**. Reasoning goes from **causes to effects**. Understand by **analysing**	Predictions don't go very far. **You'll have to iterate**. Reasoning goes from **ends to means**. Understand by **engaging**
Variables change, **structure remains** Change it by **divide and conquer** Understand it as a **top-down or bottom-up** structure, then drive it one-way from there	**Structure adapts** (resilience) Change it by **modulating stable structure** **Interact with it** as a structure with self-organised patterns, intervening at leverage points
'**Go ballistic**': Understand, plan, act, let go Project: Design stops at product **launch**.	'**Go cybernetic**': Engage, keep steering Forever beta: Design continues **in flight.**