**Systems Development Methods & Frameworks (COMP1787)**

**Tutorial 1 - Gall's Basic Systems Axioms**

(Taken from: Systemantics; how systems work... and especially how they fail by John Gall 1978)

1. Systems in general work poorly or not at all

2. New systems generate new problems

3. Systems operate by redistributing energy into different forms and into accumulations of different sizes

4. Systems tend to grow, and as they grow, they encroach

5. Complex systems exhibit unpredictable behaviour

6. Complex systems tend to oppose their own proper function

7. People in systems do not do what the system says they are doing

8. A function performed by a larger system is not operationally identical to the function

of the same name performed by a smaller system.

9. The real world is whatever is reported to the system

10. Systems attract systems people

11. The bigger the system, the narrower and more specialised the interface with

individuals

12. A complex system cannot be "made" to work; it either works or it doesn't

13. A simple system may or may not work

14. If a system is working, leave it alone

15 A complex system that works is invariably found to have evolved from a simple

system that works

16. A complex system designed from scratch never works and cannot be patched up to

make it work; you have to start over, beginning with a working simple system.

17. In complex systems, malfunction and even total non-function may not be detectable

for long periods, if ever.

18. Large complex systems are beyond human capacity to evaluate

19. A system that performs a certain way will continue to operate in that way regardless

of the need or of changed conditions.

20. Systems develop goals of their own the instant they come into being.

21. Intra-system goals come first

22. Complex systems usually operate in failure mode

23. A complex system can fail in an infinite number of ways

24. The mode of failure of a complex system cannot ordinarily be predicted.

25. The crucial variables are discovered by accident

26. The larger the system, the greater the possibility of unexpected failure

27. "Success" or "function" in any system may be failure in the larger or smaller systems to which it is connected

28. When a fail-safe system fails, it fails by failing to fail safe.

29. Complex systems tend to produce complex responses (not solutions) to problems.

30. Great advances are not produced by systems designed to produce great advances.

31. Systems aligned with human motivational vectors will sometimes work; systems

opposing such vectors work poorly or not at all.

32. Loose systems last longer and work better

**Tutorial exercise**

The purpose of this tutorial is to help you understand the reasons why systems fail and the complexities involved in making them work.

**In small groups**

1. Examine Gall’s Systems Axioms and identify **5** axioms which seem pertinent to

system failure.

2. Think of some examples from your own experience of IT systems, or from things

you have read in the press, to illustrate the **5** axioms that you have identified.

3. Be prepared to discuss your findings with the rest of the group.