Title: Sustainable agility by managing IT systems entropy.

Academic team leader(s): Prof. dr. Arend Rensink (UTwente)

Involved partners: ING

Challenge:

The core challenge in this ICT with Industry project is to objectively quantify system complexity , making it possible to follow trends on how chaos develops in your system and to react timely and appropriately. Next to that, the ability to quantify complexity opens up the possibility to also express agility in a quantitative way.

In addressing these issues, we are especially interested in n-tier, multi-platform systems, since that is the basic architecture of the existing infrastructure.

In the context of the ICT with Industry workshop, the expected contribution from the ICT research community is to answer one or more of the following questions:

- What existing research results and insights can be brought to bear? In particular, what can we learn from previous work in the domain of IT systems complexity? Not just in the world of finance, but also in the field of telecommunication that basically faces the same phenomena. In particular, which of the current approaches address n-tier, multi-platform systems? To what degree do current approaches account for Service Oriented Architectures and/or modern style (restful) APIs?

- How can complexity in IT systems be made explicit and quantifiable? For instance, how can we assign complexity to computing networks (more specific ally, instances of n-tier multiplatform)? How can we quantify this complexity? How can we define trends, and thresholds that once exceeded alerts that intervention is needed to decrease complexity

- How can agility in changing IT systems be made explicit and quantifiable? For instance, how can we define (a form of-) modular continuity across these n-tier multiplatform application, that can be used to predict (i) the effort of applying a change in specification to the mentioned system, in terms of man-hours programming or (ii) the effect on complexity as a result of such a change? How can we express the outcome as a factor of the total cost of ownership of the mentioned system?

Today, most IT systems are n-tier, multi-platform and virtualized heavily dependent on connectivity infrastructures (network, messaging, service exchange). To get an idea of the complexity, ING have created a game setting where some scenarios can be played through and visualized.

There is example system code that can be made (non-publicly) available to workshop participants.

Participants will be invited prior to the workshop to ING headquarters to get better acquainted with the context of the case, so as to allow a head start during the workshop itself.