Trust in a Nutshell

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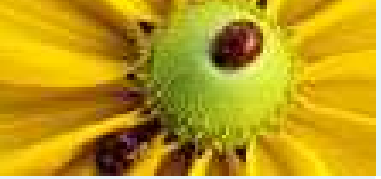
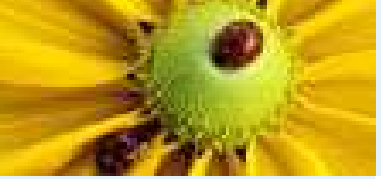


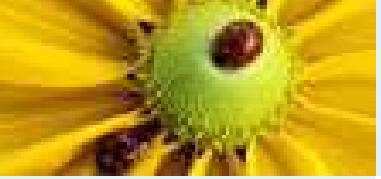
Plan of the presentation

- Do you trust me?
- Do you really trust me?
- So what?



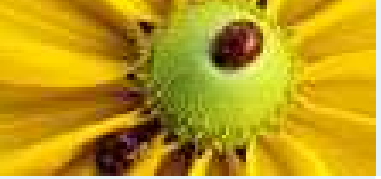
Why is trust so popular?

- Metaphorical trust expressions
  - IT security people like metaphors : firewall, honeypot, virus, Trojan horse...
  - Trust expressions serve as simple metaphors for complex security concepts : trusted code, trusted third party, trusted computing...
- Trust has very positive connotations
  - Trust expressions are ideal as marketing slogans
- Trust expressions can be difficult to intuitively understand



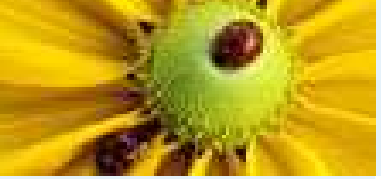
Trust expressions (outside scope)

- Trusted computing : Computing platform with additional security hardware
- Trustworthy computing : Microsoft marketing slogan
- Trust eco-system : Microsoft marketing slogan
- WS Trust : WS security standard specifying how to generate security tokens
- Trust Bar : Mozilla browser toolbar
- Circle of trust : Liberty Alliance term for group of organisations that enter into identity federation agreement
- Trust provider : Certificate Authority
- Trusted Third Party : Entity assumed to keep secrets



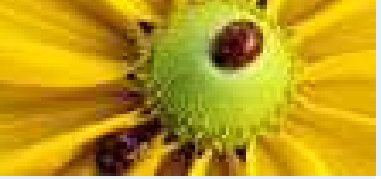
Importance of trust

- Progress requires collaboration
- Potential collaboration partners must make decisions involving risk and uncertainty
- Fear of negative consequences is an obstacle for collaboration
- Trust
  - is a catalyst for human cooperation
  - influences type and size of organizations
  - represents social capital in a community



The 2 definitions of Trust

- Reliability Trust : the subjective probability by which an individual "A" expects that another individual "B" performs a given action on which its welfare depends. (Gambetta, 1988)
- Decision Trust : the willingness to depend on something or somebody in a given situation with a feeling of relative security, even thought negative consequences are possible. (McKnight & Chervany, 1996)



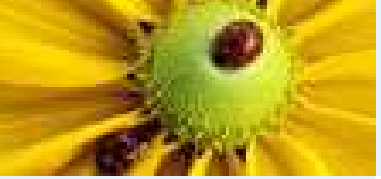
The trust relation - v1.0

Trusting party

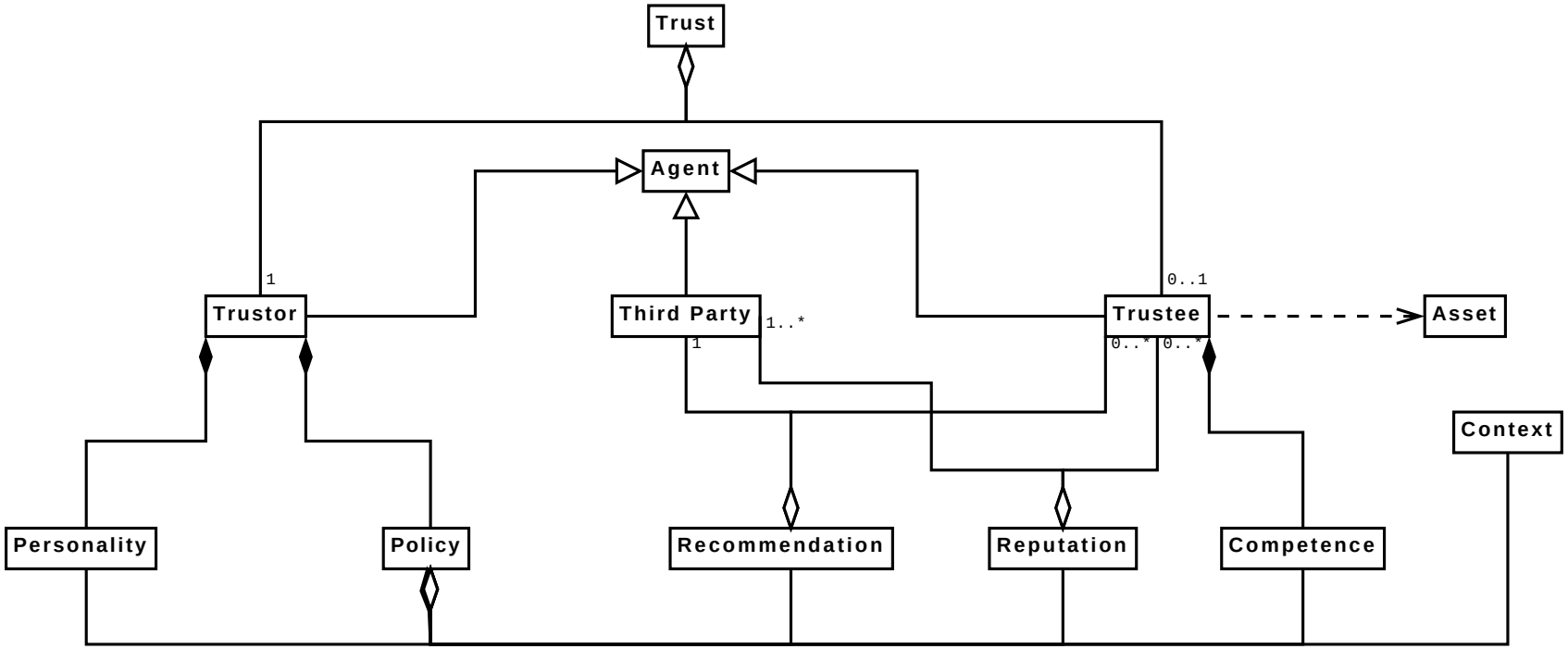
Wants to assess and make decisions w.r.t. the dependability of the trusted party for a given transaction and context

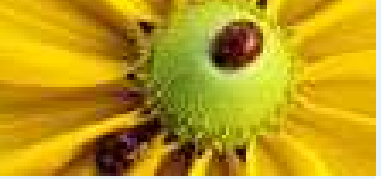
Trusted party

Wants to represent and put in a positive light own competence, honesty, reliability, and quality of service



A global (reliability) Trust relation - v2.0





Digression 1 : Chemestry of Trust

The hormone *oxytocin*

- is released after trusting behaviour
- stimulates trusting behaviour

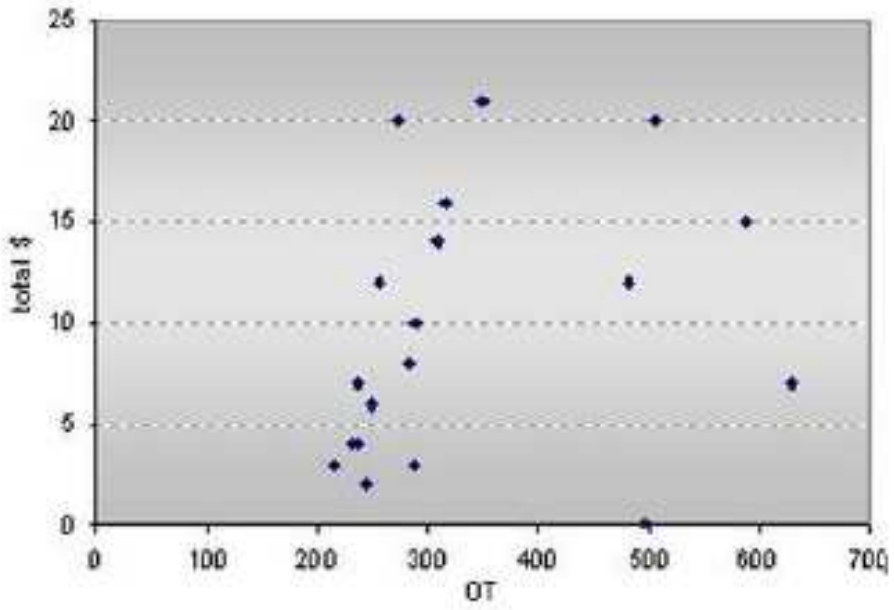
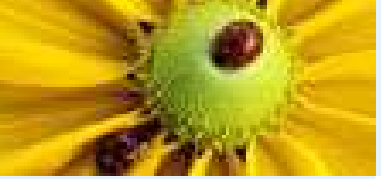
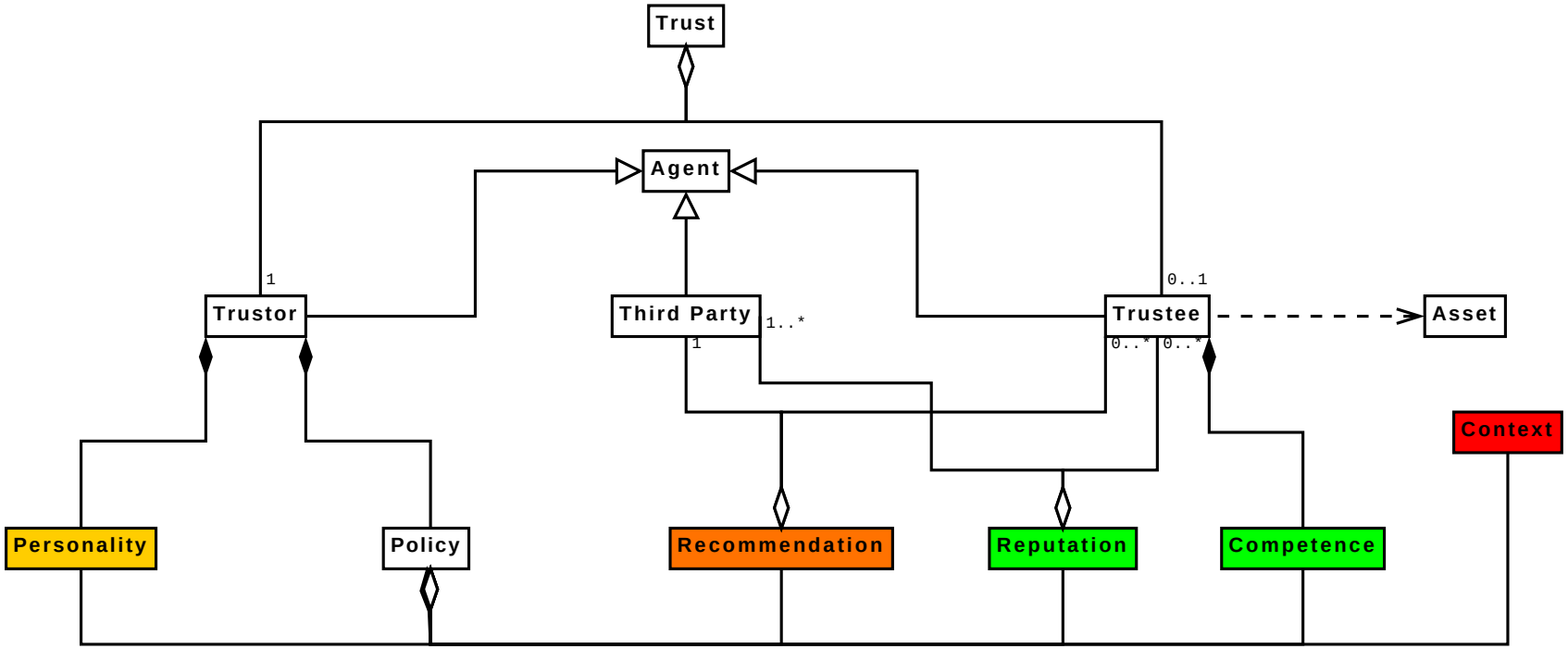
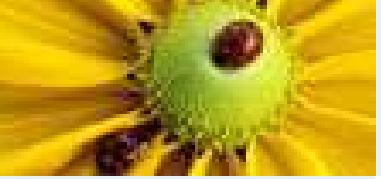


Figure 1: *Zak & al. , 2003*



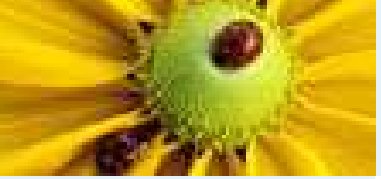
Maturity of the fields



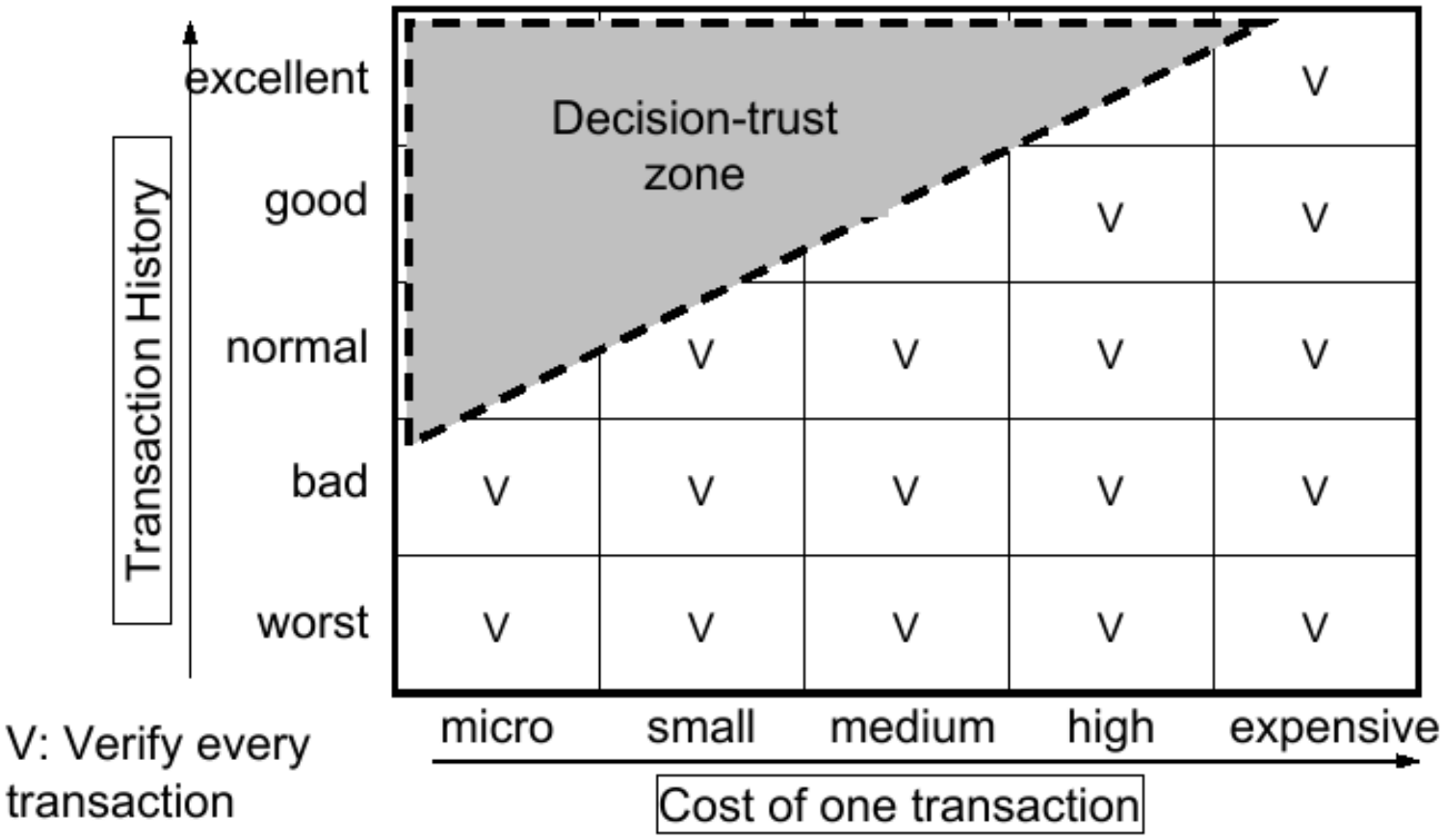


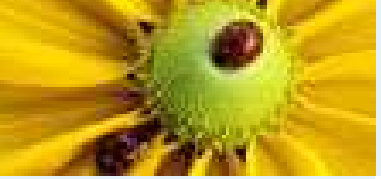
Computational Trust

- Most computational models assume reliability trust
- Decision trust not often modelled
- Decision trust can be complex and needs to take many additional factors explicitly into account, e.g. utility, risk, reliability
- Examples of decision trust models :
  - Manchala (1998)
  - Josang & Lo Presti (2004)

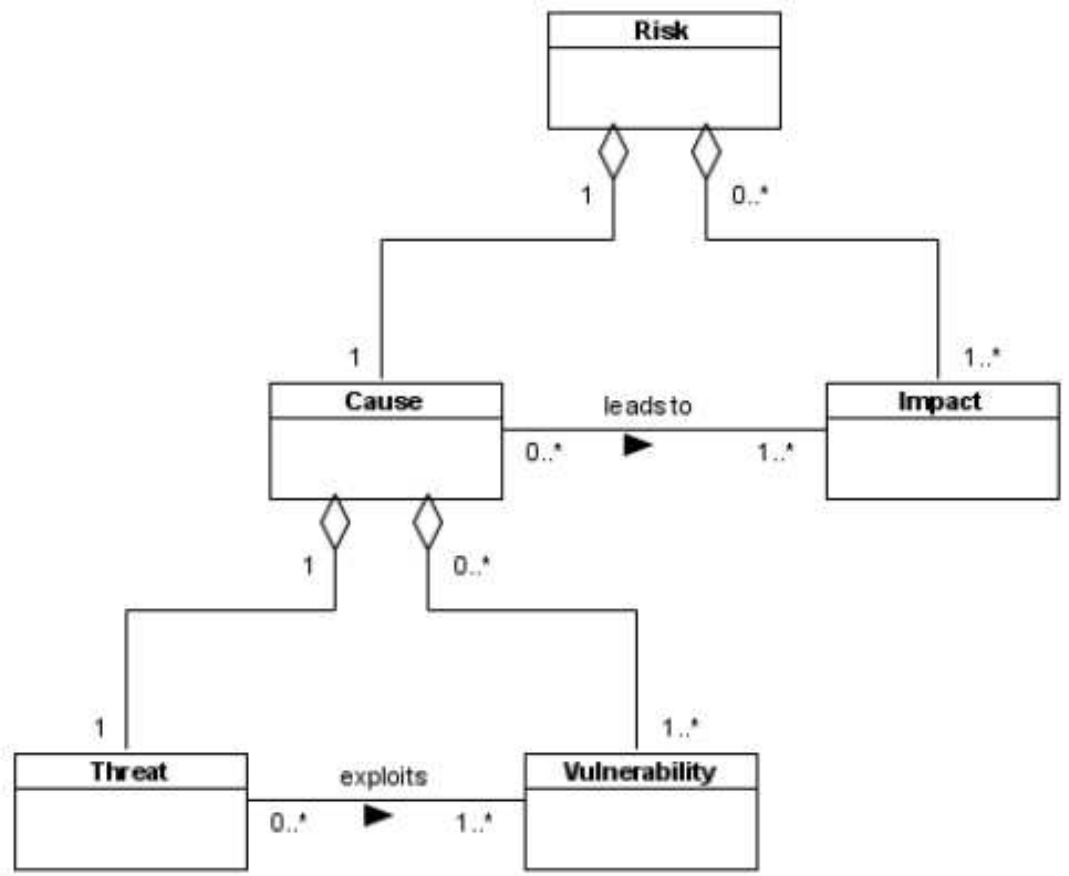


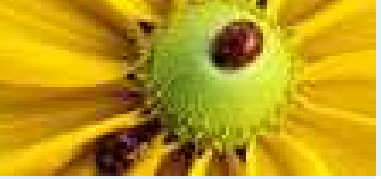
Manchala's (decision) Trust Matrix



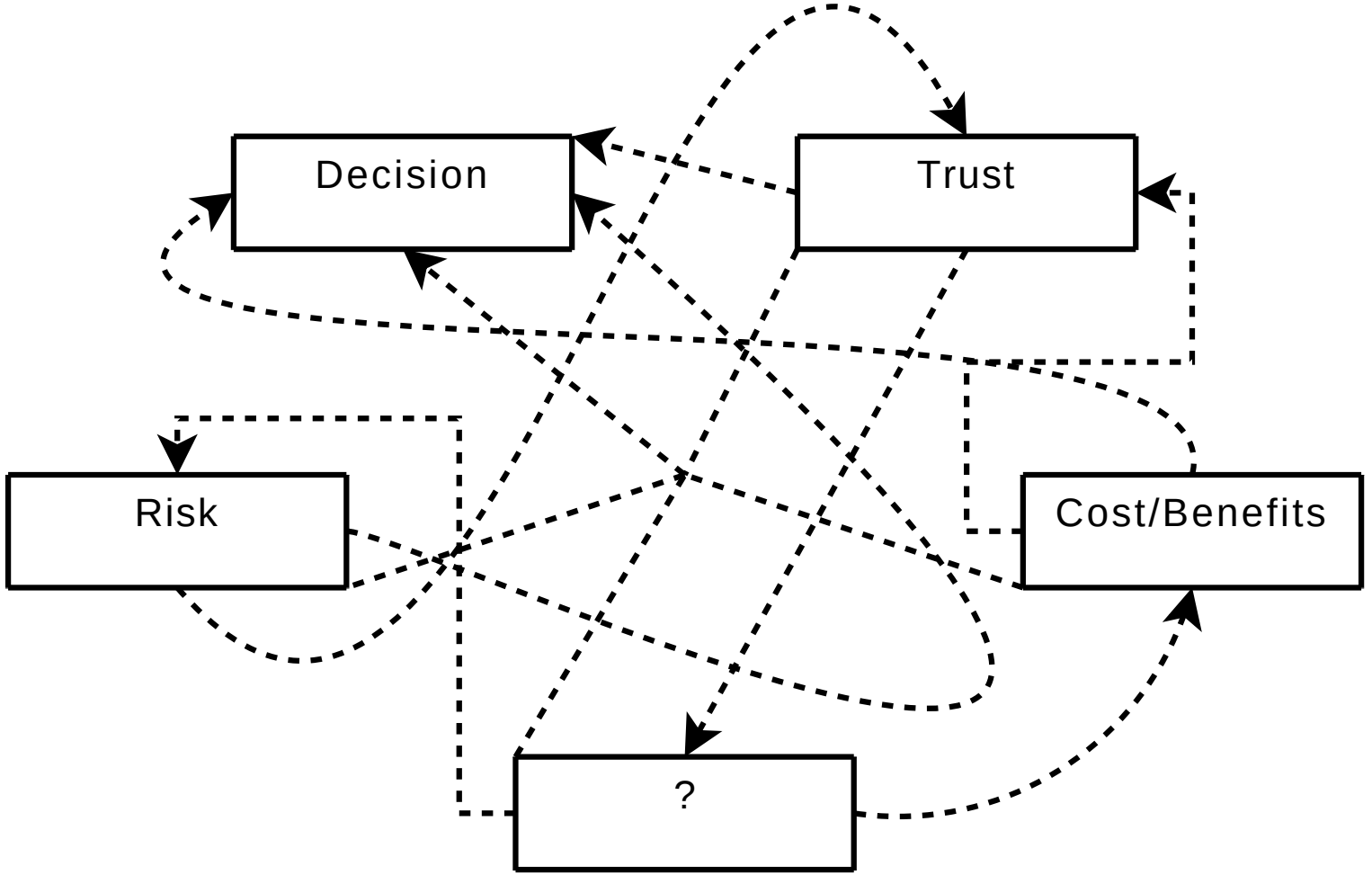


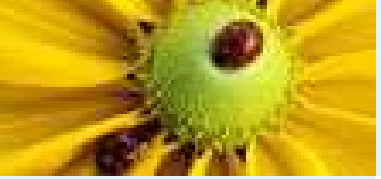
A Risk Model (*Mayer & al., 2006*)



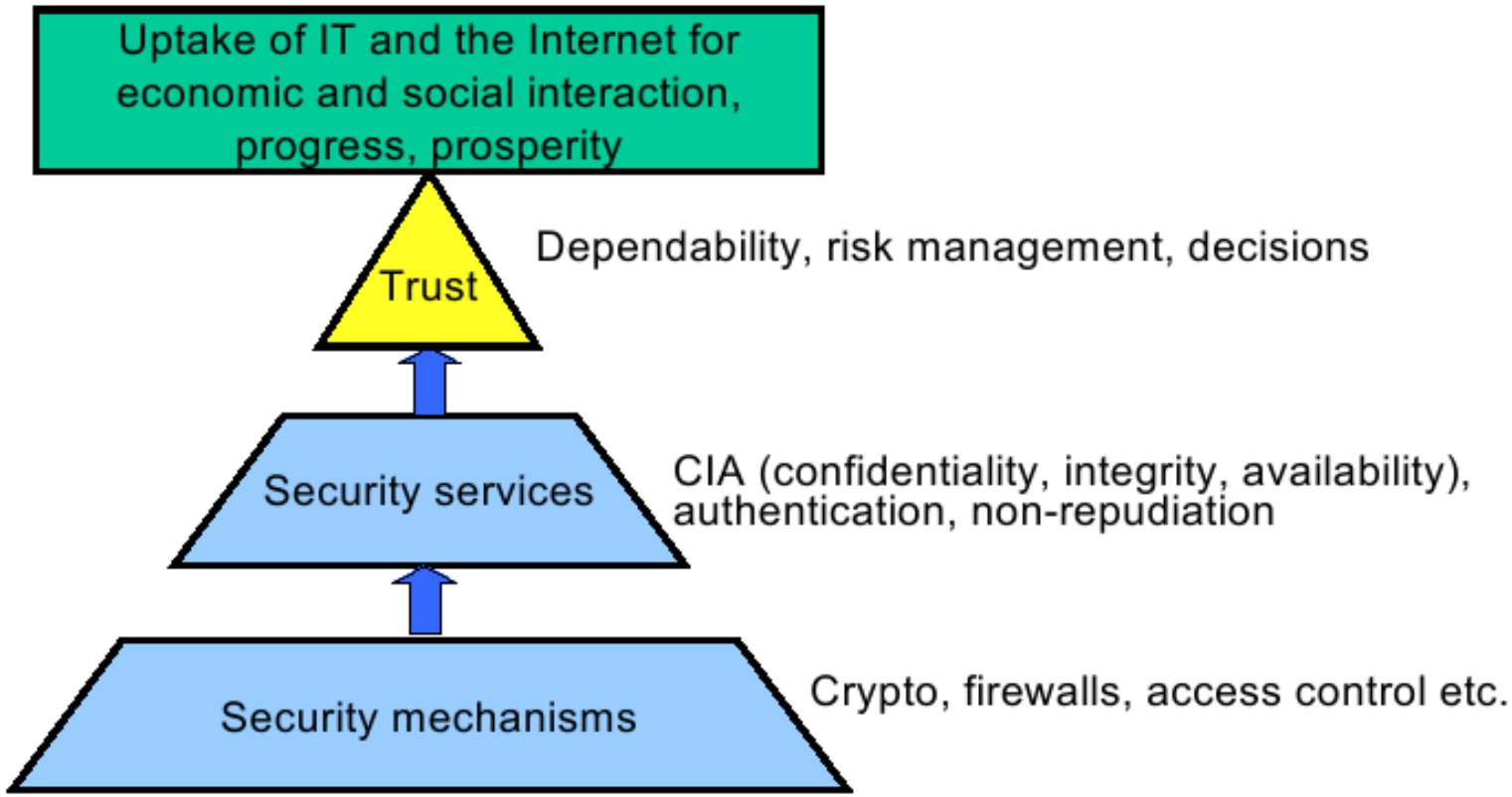


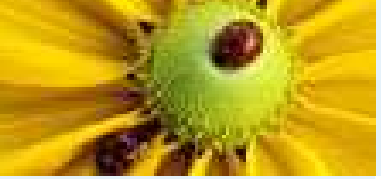
A global (decision) trust model - v2.9



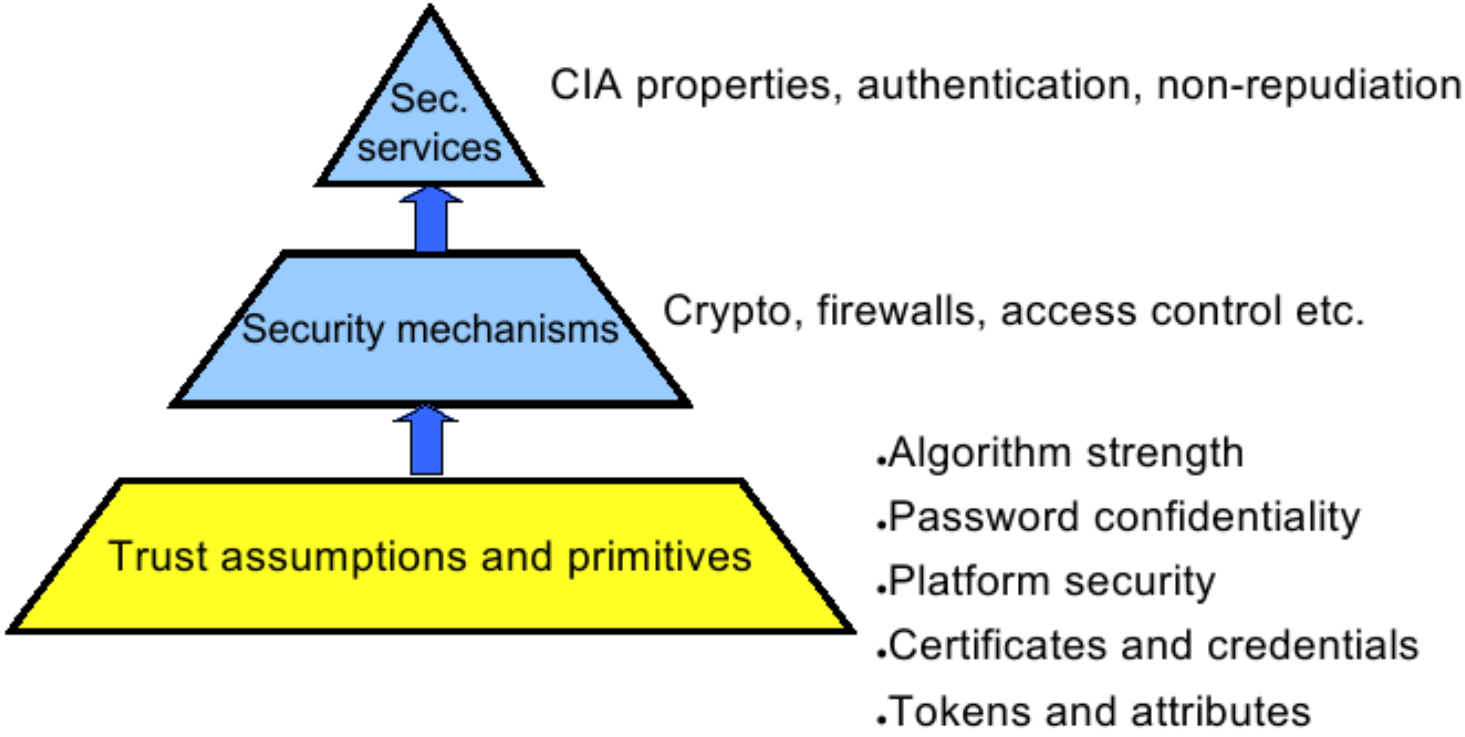


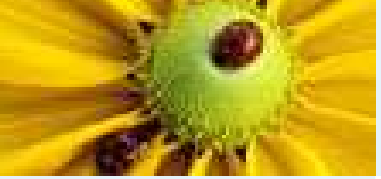
Trust as an abstract security layer





Trust as assuptions/primitives to security





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- Context : ???