

***Self-* technologies in
Industry: Niche market today,
Mass Market Tomorrow?***

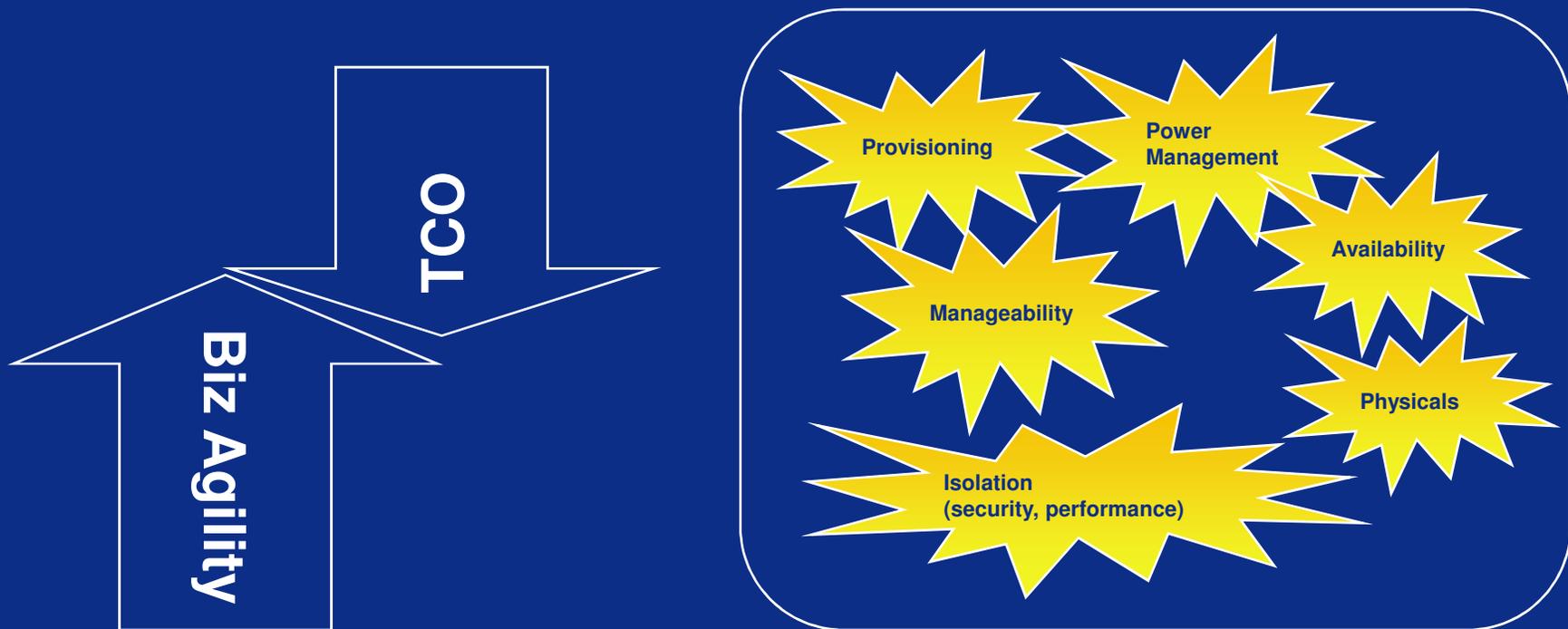
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What you hear from C*Os?

- Dynamic workload management/distribution
 - Workload dynamically assigned across systems in appropriate class
 - Systems automatically repurposed to provide appropriate # of systems per class
 - Comprehensive trending to provide input to forecasting, sourcing, purchasing, and disposition
- Dynamic provisioning and repurposing
- Performance monitoring
- Security processes and controls
- Event correlation and suppression
- Event-driven self-correction (“self healing”)
- Forwarding of unresolved incidents
- Environmental controls
- ...

Goals/Issues?

- Biz agility (ROI) is the driver; TCO is the limiter
- Difficulty in re-provisioning forces per-application over-provisioning
- High TCO per resource caps the over-provisioning



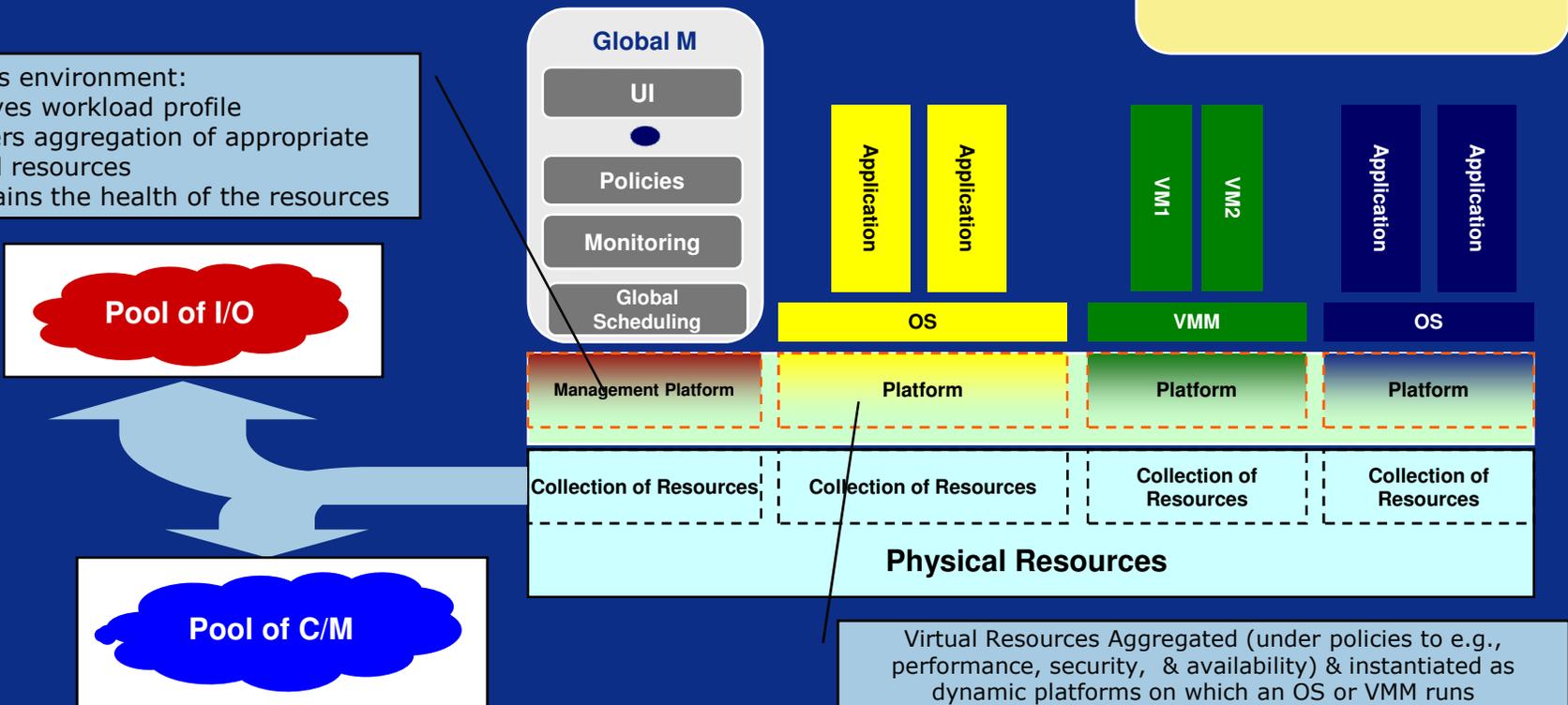
Here is one Solution

- **Dynamic virtual Platforms** from pools of resources
 - Workload management
 - Capacities/features supporting given SLAs, business models & high-level policies based on time, price & performance;
 - Scaling resources up/down to efficiently react to runtime changes (e.g., workload, fault); &
- Managing platforms
 - ... enabling self-* through Plumbing and high-level policies
 - Independent of the platforms' system software

Automonomized Resources

Manages environment:

- Receives workload profile
- Triggers aggregation of appropriate virtual resources
- Maintains the health of the resources



Policy-Based Management Scope



Power Efficient Datacenter

- Multi-Level Power Mgmt
- Performance / Watt / Sqft
- Policy-based thermal mgmt



Utility SLA

- Monitoring, Logging
- Metering
- QoS Guarantees



Security & Audit

- AAA – Authentication, Authorization, Access Control
- Intrusion Detection & Isolation
- Identity Management
- Auditing



Dynamic Resource Allocation

- Policy Driven Provisioning
- Load Balancing
- Migration
- Fail-over



Simplified Management

- Discovery & Configuration
- In-Band / Out-of-Band
- IPMI, CIM, SMASH



Data Intensive Computing

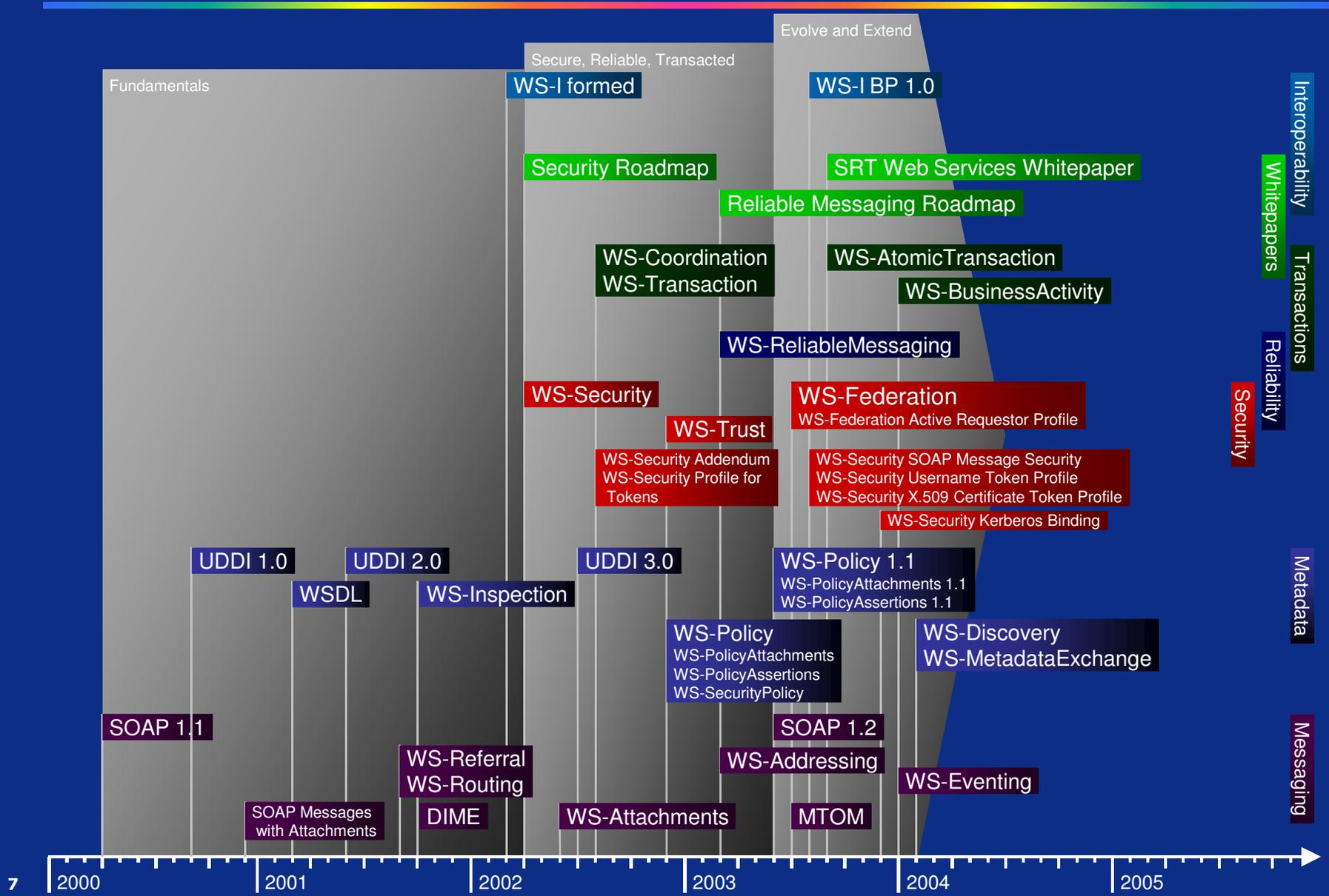
- Dynamic, Policy Based Transformations
- Federated Data
- Messaging

Conclusions

- Self-* are happening
 - ... However, great deal of both research & technology development challenges still exist
 - Can build the plumbing, but the intelligence will lag
 - Interoperability will always remain an issue
 - Standards are the right place to work together
 - ... But let's first take a serious look at what we have been doing
- Yes, it will be mass market tomorrow
 - ... covering servers, desktops, mobile, ...

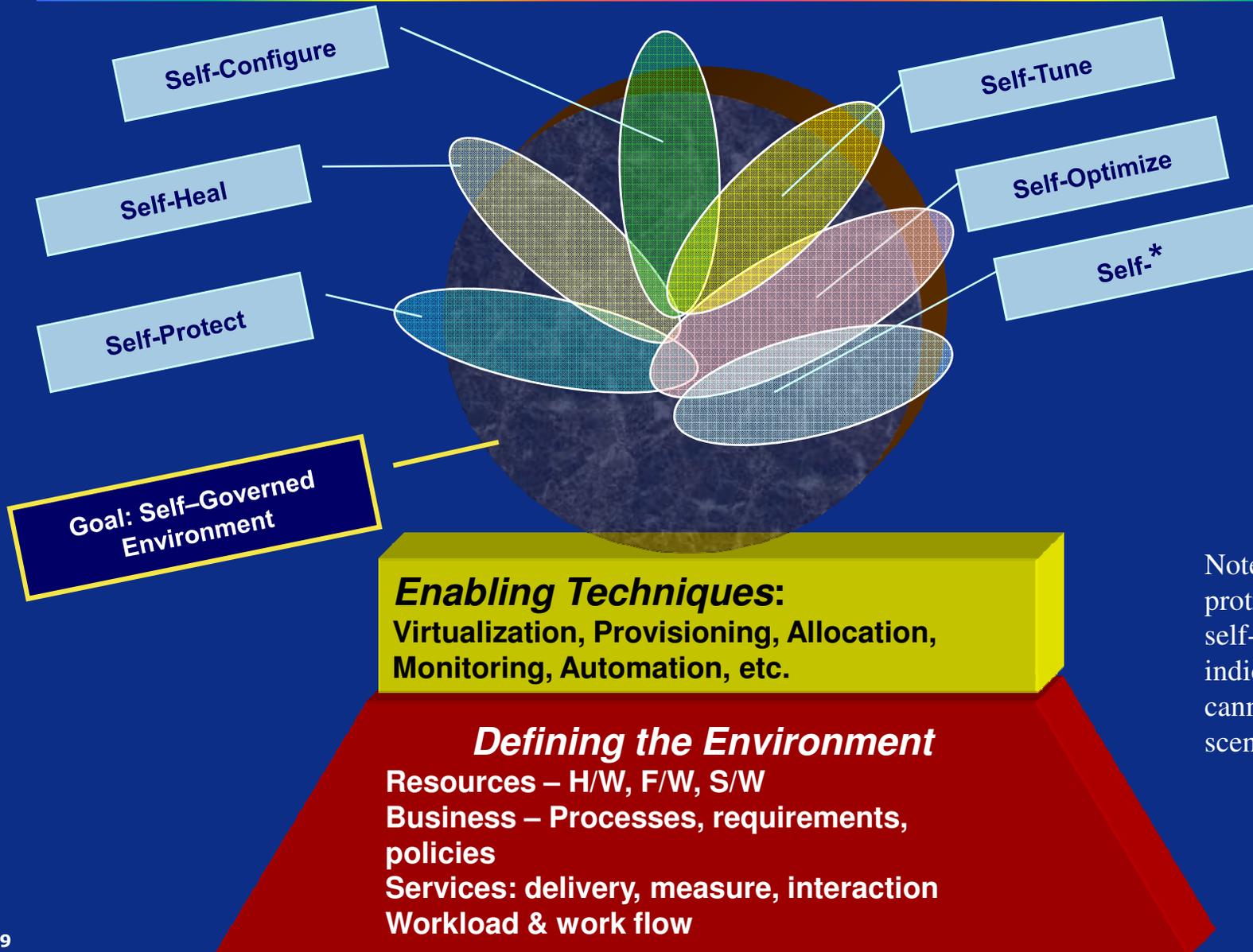
Web Services Architecture

Timeline (AS OF 2/2004)



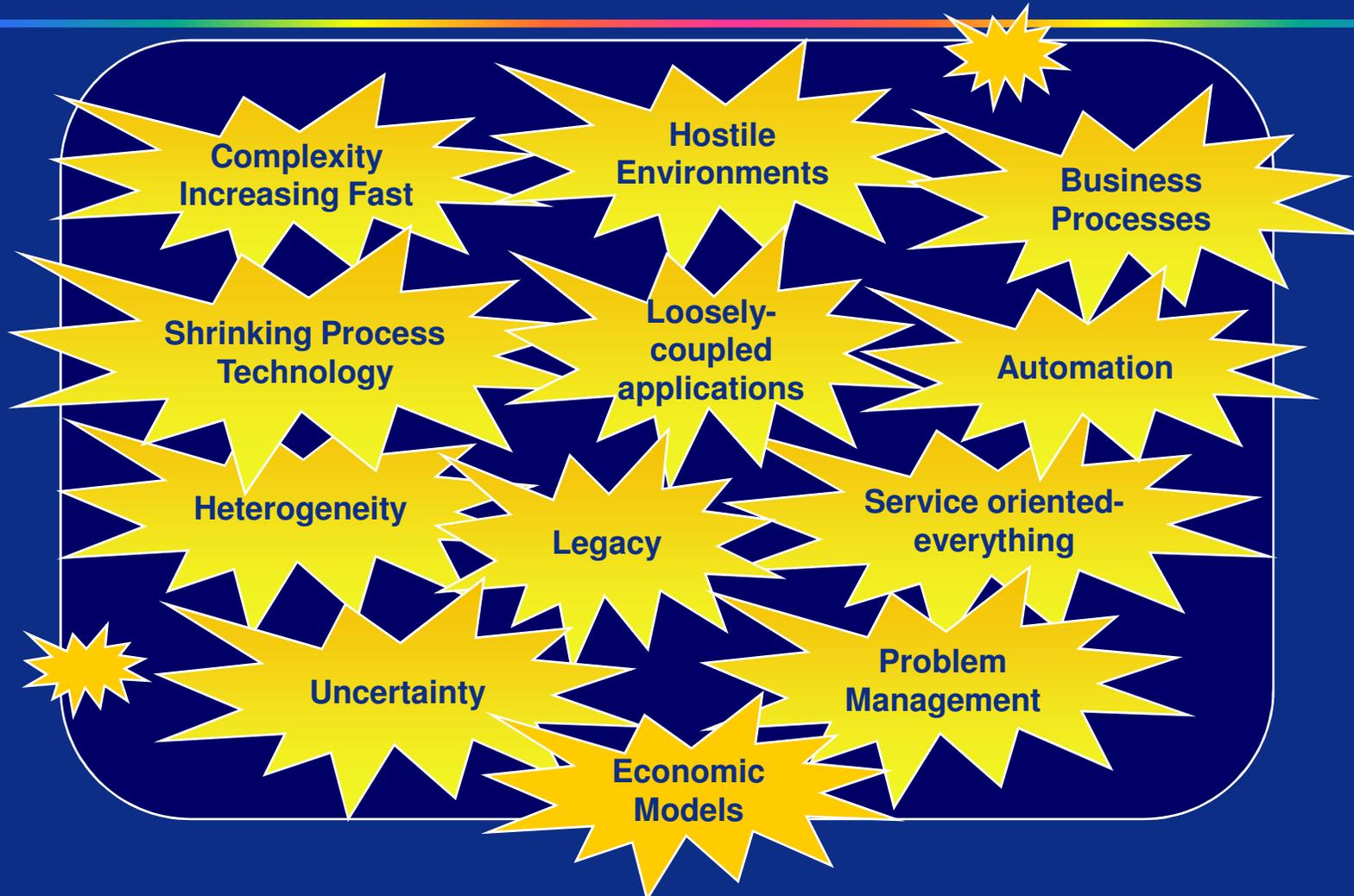
Backup

Self-*



Note that the petals protrude outside the self-managed disc to indicate that we cannot Self* all scenarios.

Self-* Environmental Landscape



Talk about Chaos