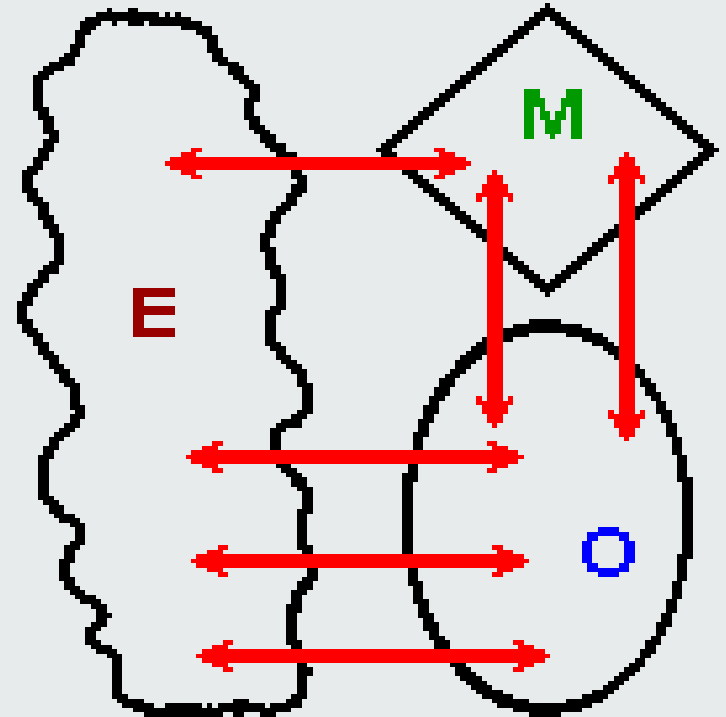


Extended Viable System Model

Alexey Sergeev, José Tribolet

Viabile System Model

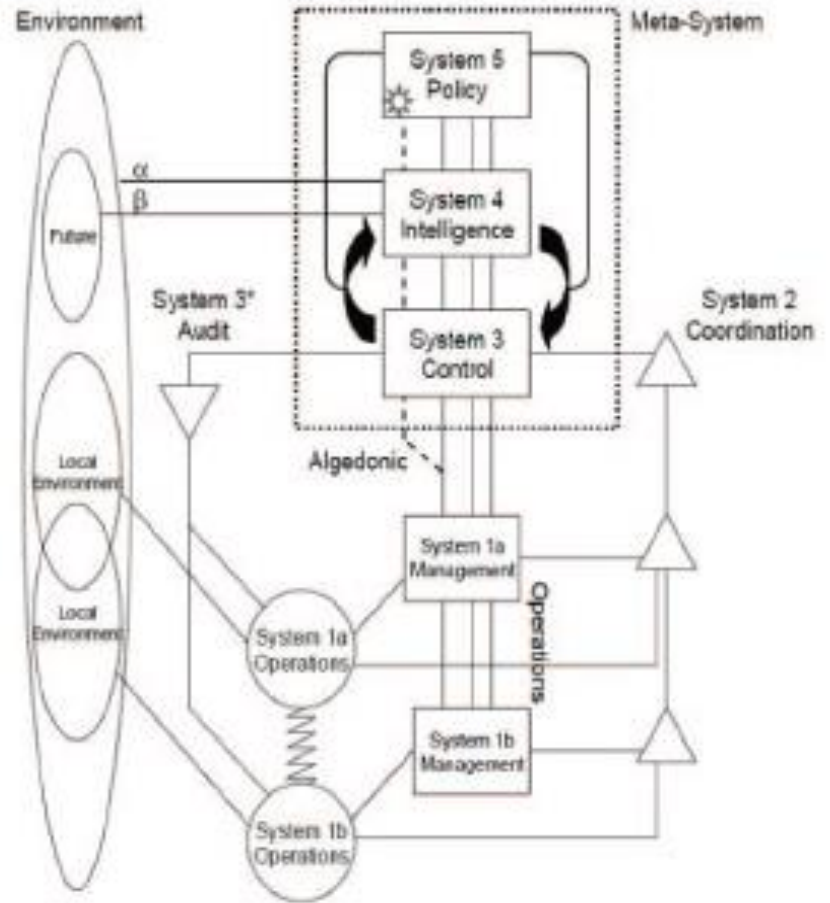
Viabile system is any system organized in such a way as to meet the demands of surviving in the changing environment.
[S. Beer]

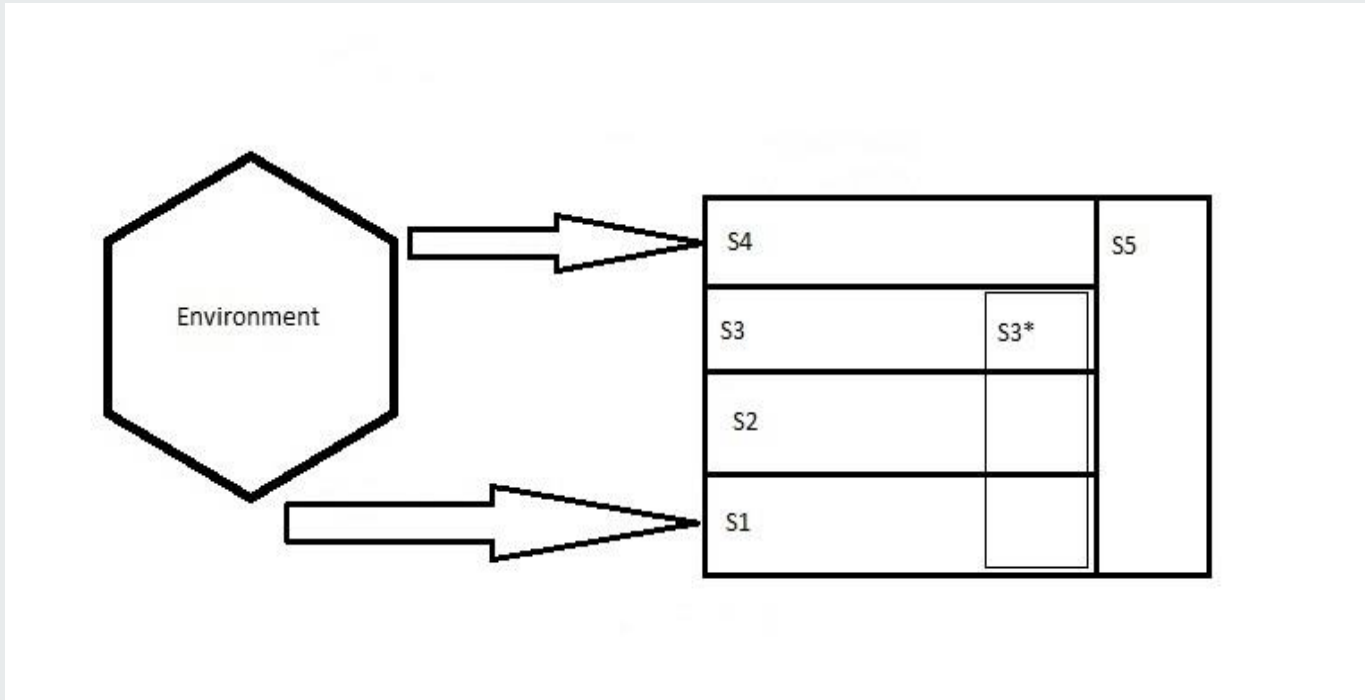


adopted from “The VSM Guide” by J. Walker

Viable System Model

adopted from "The Use of Viable System Model to Develop Guidelines for Generating Enterprise Architecture Principles" by M.E. Zadeh et al.





VSM basic model - adaptation

Critique of VSM

- No explicit definition of how *homeostat* (a special case of a feedback system which helps to maintain a set of variables among expected values regardless of the nature of perturbations that may affect them) works.
- Communication is of crucial importance, while no explicit definition of communications means and rules.
- No explicit definition of the system for top-down control independent from S5.
- VSM underplays the purposeful role of individuals in organizations

Proposal: VSM extensions

1. Immune System

The set of deep crucial mechanisms which can intervene into any System's operation and make changes to Systems in the situation of crisis. On one hand, such mechanisms are created by S3, S4 or S5, but on the other hand they can change parent System.

Examples within enterprise:

- Board of Directors of a company
- Shareholder meeting
- Legal attorney can veto any activity if it contradicts with the law

Proposal: VSM extensions

2. Language

Everything which helps enterprise members (including VSM Systems) to communicate and understand each other. Based on the literature review, it is needed to explicitly specify:

a. Communication channels – ways, format and media for communication. Examples of defined communication channels may be:

- Meeting minutes should be sent via email
- Interview with job applicant should be done either face to face or via phone

Proposal: VSM extensions

b. Shared vocabulary – enterprise (and departments within enterprise) may have certain specific terms for certain specific things. It is highly important that communicating subjects are sharing the same vocabulary.

Examples:

- Specific terms for yearly performance review sessions with managers
- Specific terms for the level of employee on the career ladder (e.g. junior engineer – engineer – senior engineer – principal engineer)

c. Context – understanding of the meaning of the message is dependent on the context. It is important to explicitly define context for certain communication channels and information flows.

Examples of the importance of context:

- Term “BMC” may mean “Baseboard Management Controller” for hardware engineer, while for manager it may mean “Business Model Canvas”

Proposal: VSM extensions

3. Tools

It is important to explicitly specify hardware and software tools which enhance communication by making it faster, more efficient, and/or secure.

Examples:

- Access to corporate email from mobile devices (faster communication)
- VPN connection to corporate network assets (more secure communication)

Proposal: VSM extensions

4. Competence

Individuals are not taken into account when using standard VSM, while people are the essential part of every enterprise. One of the main attribute of employees from employer's perspective is their competences. The proposal is to add explicit specification of competences to the extended VSM.

Proposal: VSM extensions

5. Sensors/triggers

We want to replace and extend the notion of homeostat by explicit specification of:

Sensors – mechanisms for information gathering and state monitoring.

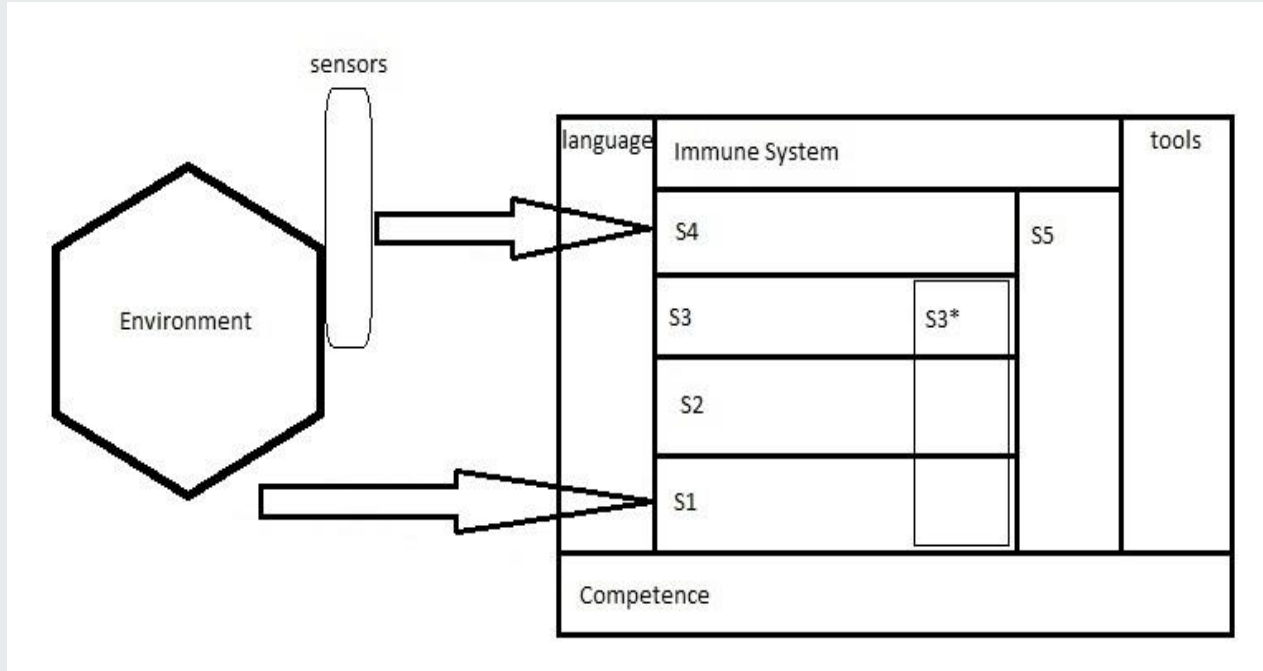
Triggers – thresholds for sensor values and reactive actions for thresholds violation.

In order to be controllable, system must be observable and have mechanisms which react on certain sensor outputs – i.e. triggers are necessary. Having sensors and triggers is a mandatory condition to steer the organization.

Proposal: VSM extensions

Example:

- Sensor: regular monitoring of governmental legislation for changes which may affect enterprise operation.
- Trigger: if there is a new legislation which may affect enterprise operation, legal department must review it and propose respective changes to comply with new legislation.



Extended VSM proposal

Case study: first findings

Case describes European customer support department of a multinational company. Customer support is outsourced to 3rd-party vendor providing technical and warranty support services to company's customers in the region. The goal of the case study is not to build VSM for this department, but to review employees' roles and processes within this department in order to find those which cannot be categorized according to standard VSM.

Case study: first findings

1. Language

a. Communication channels

- Meeting minutes should be sent via email
- Contract termination notice must be sent via paper mail

b. Shared vocabulary

- “AR” means “Action Required”
- “Grade” means level of professionalism of employee

c. Context

- Company is going to acquire company X – knowing this fact is changing context of certain conversations and decision making processes.
- Term “BMC” means “Baseboard Management Controller” for product support engineer, while for higher management it may also mean “Business Model Canvas”

Case study: first findings

2. Tools

- Email being the basic tool of communication with email on mobile devices, secure email and access to email from outside of corporate VPN being enhanced versions of this tool.
- CRM – enhanced communication tool, since it is more secure, approved by legal department and faster way of communication with customers for difficult projects.

3. Immune System

- Legal department can stop any activity at any time
- Crisis team can stop production lines at factories

Case study: first findings

4. Competence

- Competence to be an interface between product developers and business managers
- Product competence to train technical agents

5. Sensors/triggers

- Sensor: monitoring social networks for negative posts; trigger: if number of negative posts grew >100% vs yesterday, need to report to regional marketing immediately.
- Sensor: monitoring warranty returns; trigger: if number of warranty returns grew >30% vs last week, need to review associated support tickets and report to respective business unit.

Future research

1. Finish the case study to validate proposals.
2. Find similarities between viable systems in general and distributed systems. The idea is to apply these mechanisms to VSM and possibly find more room for VSM extension and improvement. The hypothesis is that distributed systems (especially distributed operating systems) have explicit specifications of certain mechanisms which are implicitly included or not at all included into VSM.
3. Explicitly define parts of Enterprise Operating System (EOS). Hypothesis is that EOS includes parts of extended VSM plus some other mechanisms. The idea is to merge extended VSM with model of distributed operating system and so create reference model of Enterprise Operating System.