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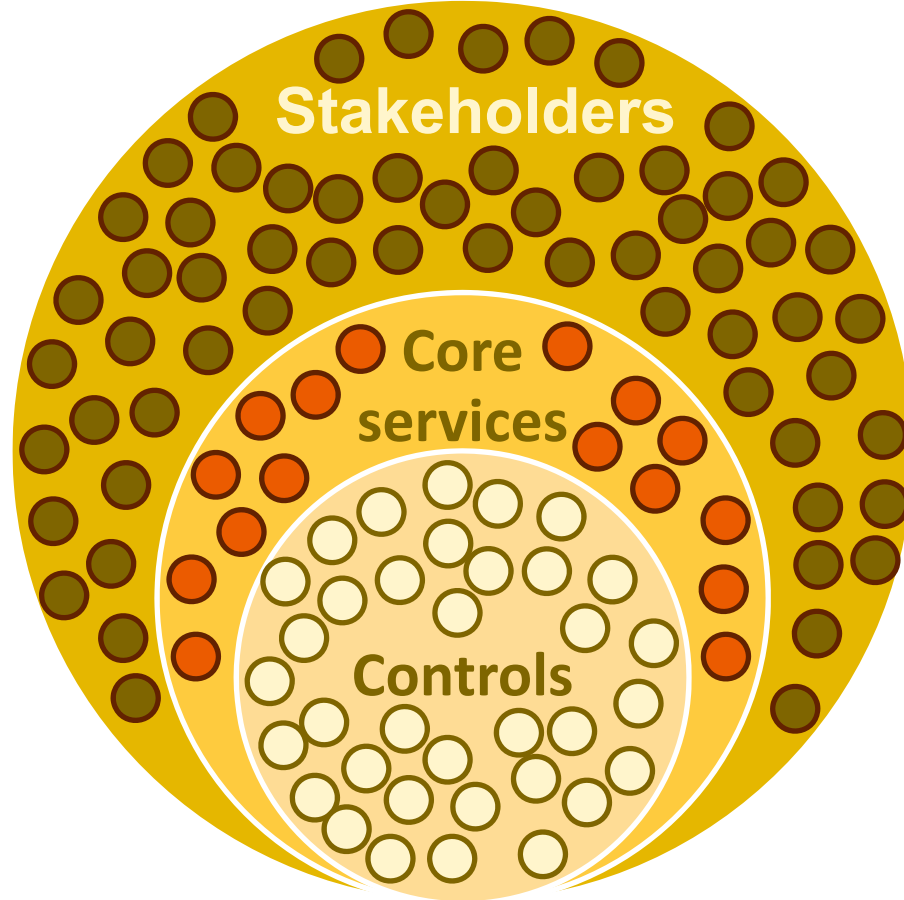


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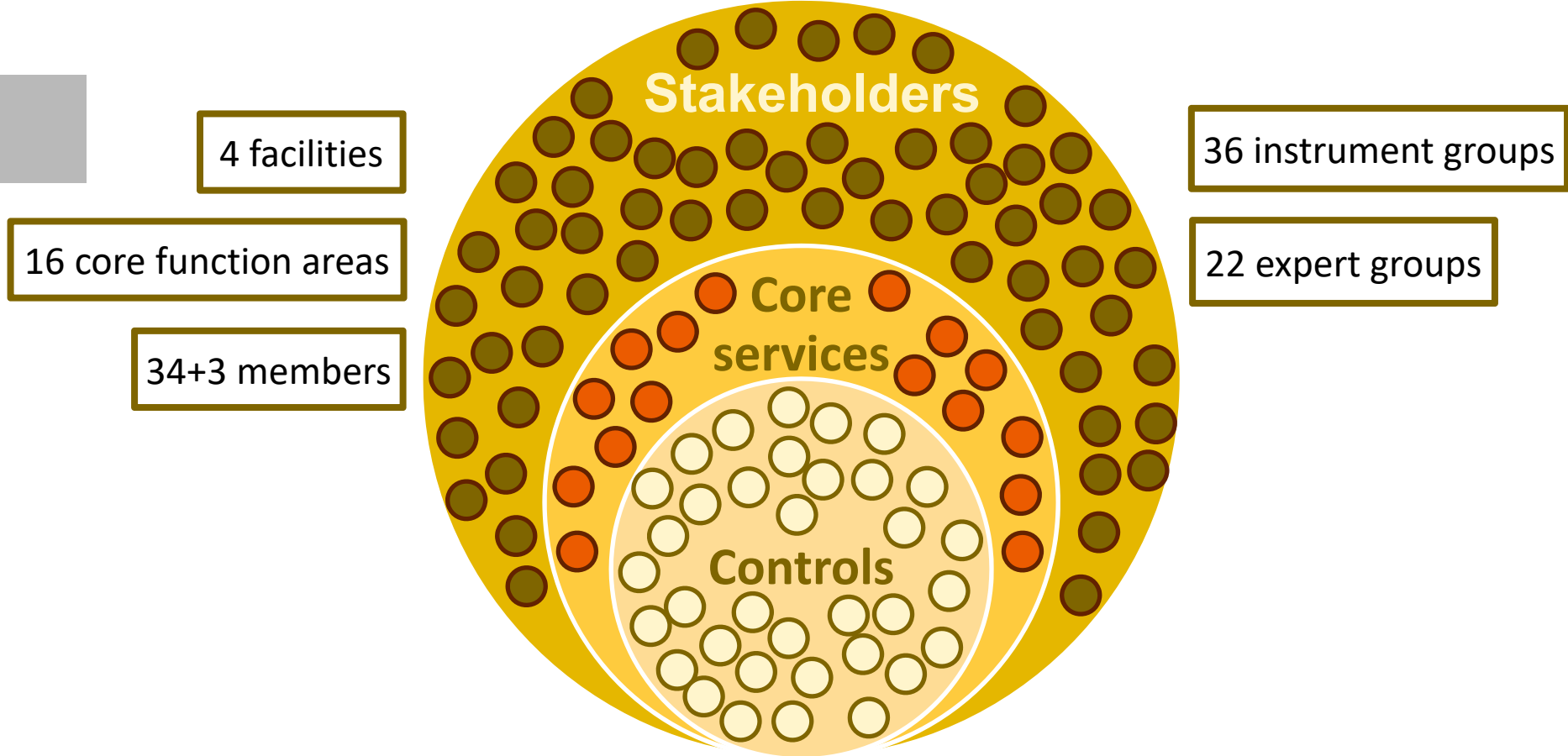
The Hybrid Identity of a Control System Organization: Balancing Support, Product, and R&D Expectations

Controls Lightning Talk session for the 2023 ICALEPCS, 18.9.2023

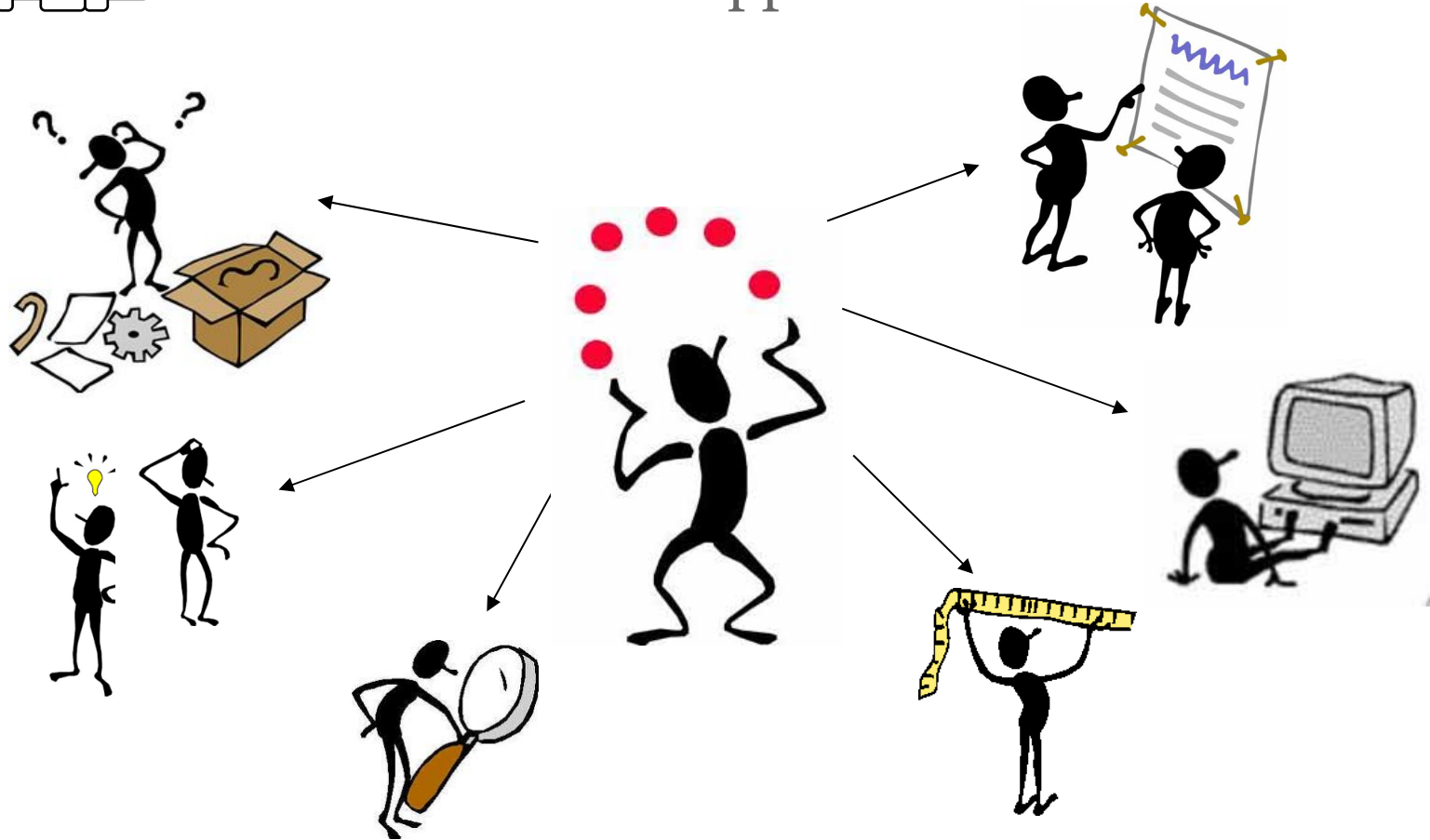
A common Controls situation



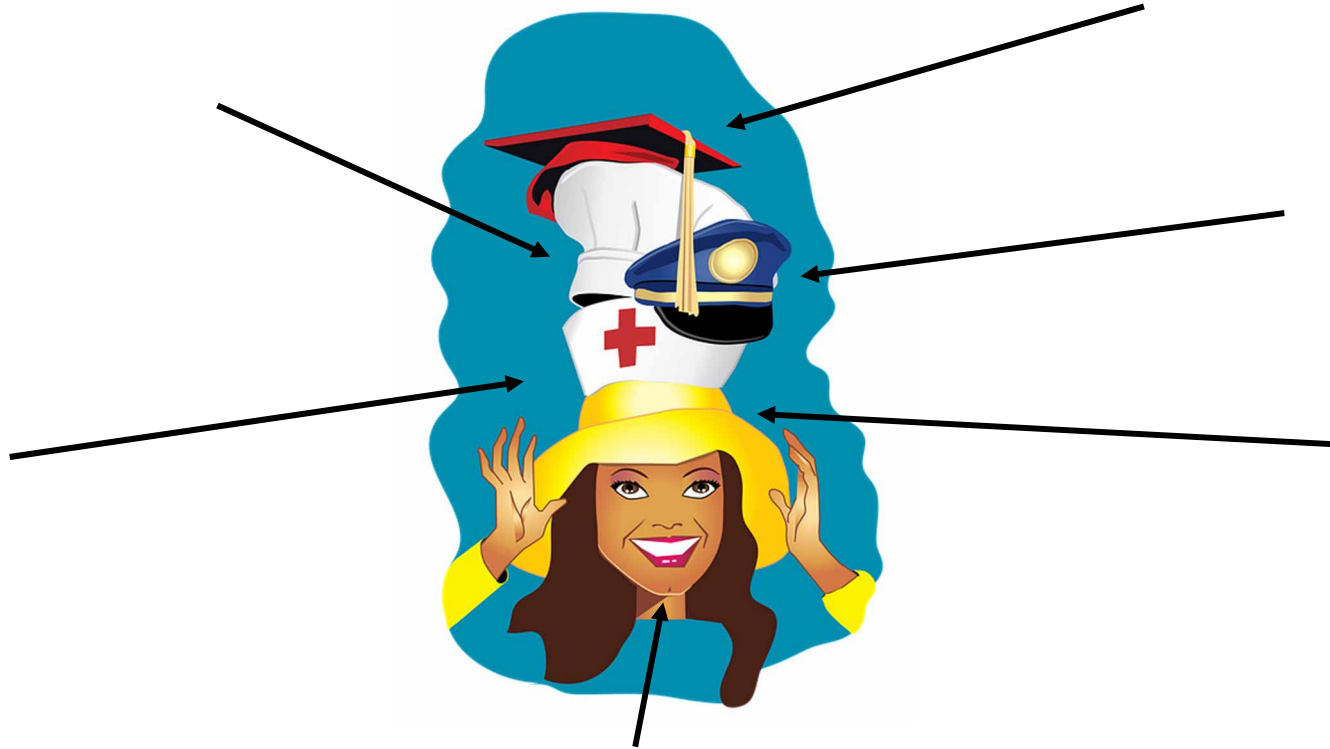
A common Controls situation: PSI numbers



What often times happens:



The many hats of Controls organizations



And still smiling!

Creating clarity: naming the hats

Service provider *project-based work, wide range of services, customized to a stakeholder*

Support organization *ongoing support and issue resolution for end-users*

Maintenance organization *care and management of production software and systems*

Platform organization *providing a foundational software platform and infrastructure*

Product organization *creating and delivering standalone software products and features*

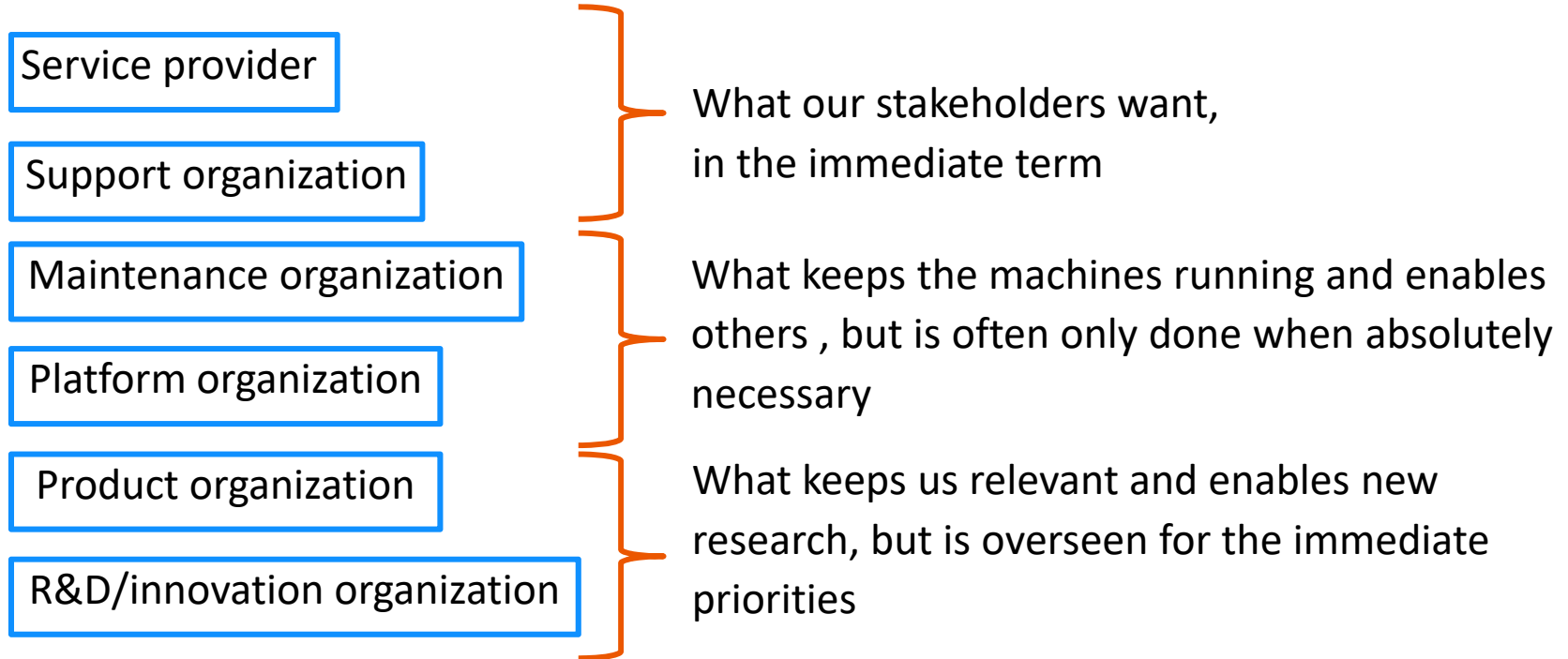
R&D/innovation organization *exploring new technologies and concepts*

These roles all co-exist within the umbrella of a control system organization!

The consequences of trying to fit it all together

- **Stakeholder driven work** - decisions are local instead of global
- **Technical debt** - no time left for cleanup, refactoring, streamlining
- **Neglect of long-term strategic issues** - we do only what is needed now
- **Lack of innovation** - what keeps us and our lab relevant
- **Lack of direction** - what helps focus our work
- **Becoming a feature factory** - everyone gets what they want
- **Spreading too thin** - lack of focus, doing a little bit of everything
- **Maintenance overhead** - more time spent on maintaining custom solutions
- **Lack of challenging tasks** - our engineers don't get enough technical development
- **Demotivation** – difficulty meeting all expectations, less work satisfaction

Who wants what? Who needs what?



Breakdown of orientation of roles and work

Service provider

Support organization

Maintenance organization

Platform organization

Product organization

R&D/innovation organization

Internally driven

Vs

Externally driven

?

Core function

Vs

R&D

?

A framework for classifying roles to orientation

	R&D, Product organization	Maintenance, Platform organization
<i>Internally driven</i>	<p>Controls as creators of new SW and novel ideas</p> <p>Key actors and example activities: Controls, (research groups, expert groups); archiving, timing, cameras, motion</p>	<p>Controls as maintainers of systems, providers of SW platform and infrastructure</p> <p>Key actors and example activities: Controls, (research groups, expert groups); EPICS, OS provisioning, infrastructure</p>
	Service organization	Support organization
<i>Externally driven</i>	<p>Controls as resource in custom projects</p> <p>Key actors and example activities: Research groups, expert groups; custom integration, new HW support</p>	<p>Controls as end-user contact, trouble shooter</p> <p>Key actors and example activities: Research groups, expert groups; resolve operational issues, training</p>
	<i>R&D work</i>	<i>Core function work</i>

Visible vs Invisible – Explicit vs Implicit

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Perspectives: time horizon

	R&D, Product organization	Maintenance, Platform organization
<i>Internally driven</i>	<p>Controls as creators of new SW and novel ideas</p> <p>“Non-urgent”</p> <p>Key actors and example activities: Controls, (research groups, expert groups); archiving, timing, cameras, motion</p>	<p>Controls as maintainers of systems, providers of SW platform and infrastructure</p> <p>Key actors and example activities: Controls, (research groups, expert groups); EPICS, OS provisioning, infrastructure</p>
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	<i>R&D work</i>	<i>Core function work</i>

Perspectives: locality

	R&D, Product organization	Maintenance, Platform organization
<i>Internally driven</i>	<p>Controls as creators of new SW and novel ideas</p> <p>“Non-urgent” and Global Perspective</p> <p>Key actors and example activities: Controls, (research groups, expert groups); archiving, timing, cameras, motion</p>	<p>Controls as maintainers of systems, providers of SW infrastructure</p> <p>Key actors and example activities: Controls, (research groups, expert groups); EPICS, OS provisioning, infrastructure</p>
	Service organization	Support organization
<i>Externally driven</i>	<p>Controls as resource in custom projects</p> <p>“Urgent” and Local Perspective</p> <p>Key actors and example activities: Controls, research groups, expert groups; custom integration, new HW support</p>	<p>Controls as end-user contact, trouble shooter</p> <p>Key actors and example activities: Research groups, expert groups; resolve operational issues, training</p>
	<i>R&D work</i>	<i>Core function work</i>

Tension at the intersection of internal vs external

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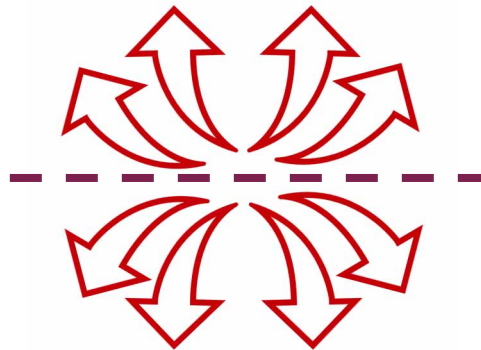
Tensions arise when different actors have different organizational incentives!

Difference in organizational incentives

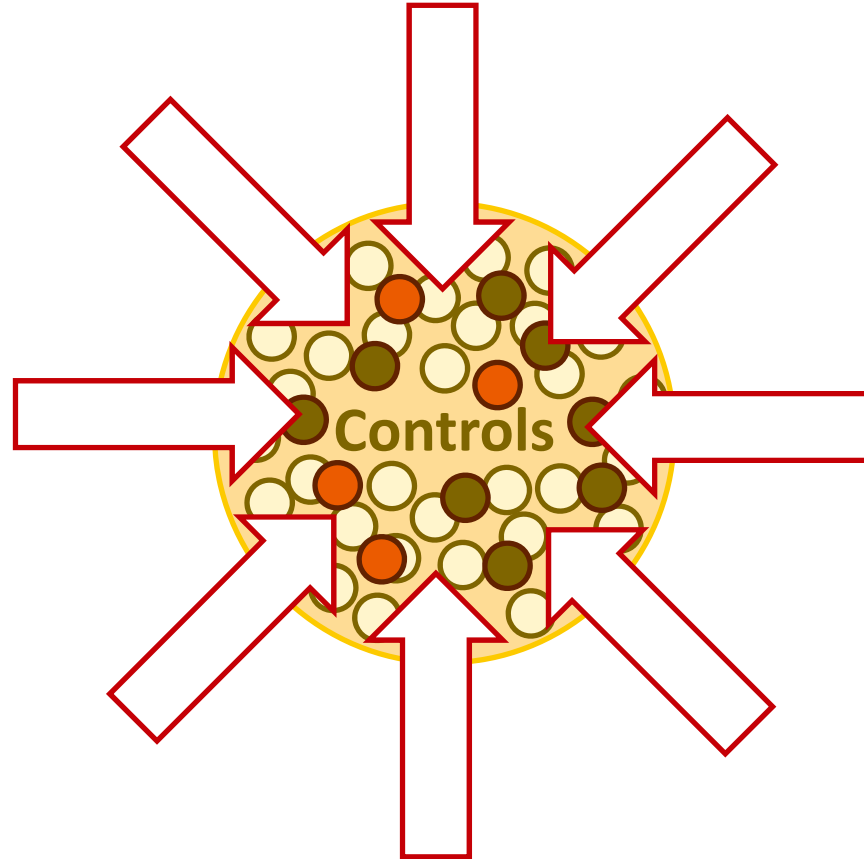
This is not “just” a problem of too much to do, too few resources and unclear priorities

There is a **fundamental tension** between our core missions and the core missions of our stakeholders, a **difference in organizational incentive**:

Custom service and support **vs** long term product and platform



Differing incentives coincide inside Controls orgs

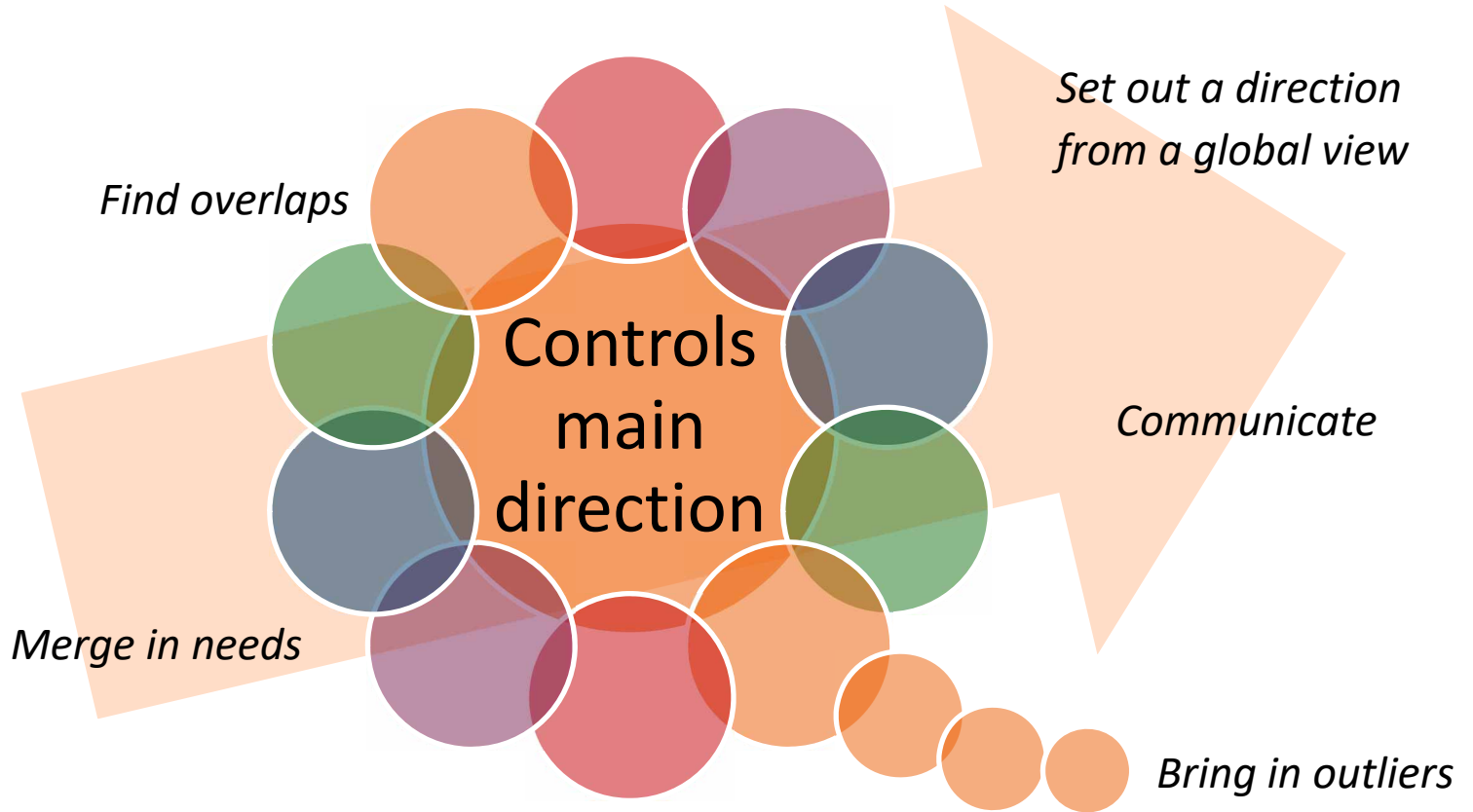


Let's be realistic

Reality: Diverse organizations such as a research lab will seldom be able to prioritize one research project over another.

It is **in our interest**, and arguably **in our responsibility** to keep this tension in check and **not lose track of our core mission(s)**, while **understanding the incentives of our stakeholders**

What to do? Our most important tool.



Sets the playing field – with freedom to form

- Reference point
- Aligned expectations
- Awareness and acceptance of others
- Brings invisible roles to the spotlight



How will you play?



In conclusion

- There is a fundamental tension between our organizational incentive, and those of our stakeholders
- Knowledge about the tensions can help us understand our challenges and prioritize in times of high pressure
- Tensions can also be a catalyst for creativity and new solutions - Controls has an opportunity to lead in addressing these tensions
- **The most important tool to reconcile tensions is *communication* and *direction***
 - **Set a general direction roadmap**
 - **Communicate it**
 - **Invite and bring in others**

Thank you for listening!

- I am happy to discuss and exchange on these observations
- Many thanks to my peers at various labs that have shared their experiences with me
- Many thanks to my colleagues and friends for feedback, helping refining these thoughts

