Industry and Tool Development

- Cable Television Originates 1940s
- First 50 years of innovation focused on television technology
- 1995 Industry transformation– introduction of HFC and high-speed internet (4000kps)
- Next 25 years, exponential growth and innovation in transforming the industry
- Software electronic cable tools to measure and monitor have had to evolve with the architecture

2020
- Remote Phy
- Gig Speeds

2000/2010
- DOCSIS Expands
- New Architecture

1980/1990
- Fiber-HFC
- 750MHz Rebuild Return

1960/1970
- DSP
- SCTE-1969

1940/1950
- Video Begins
- Amplifiers
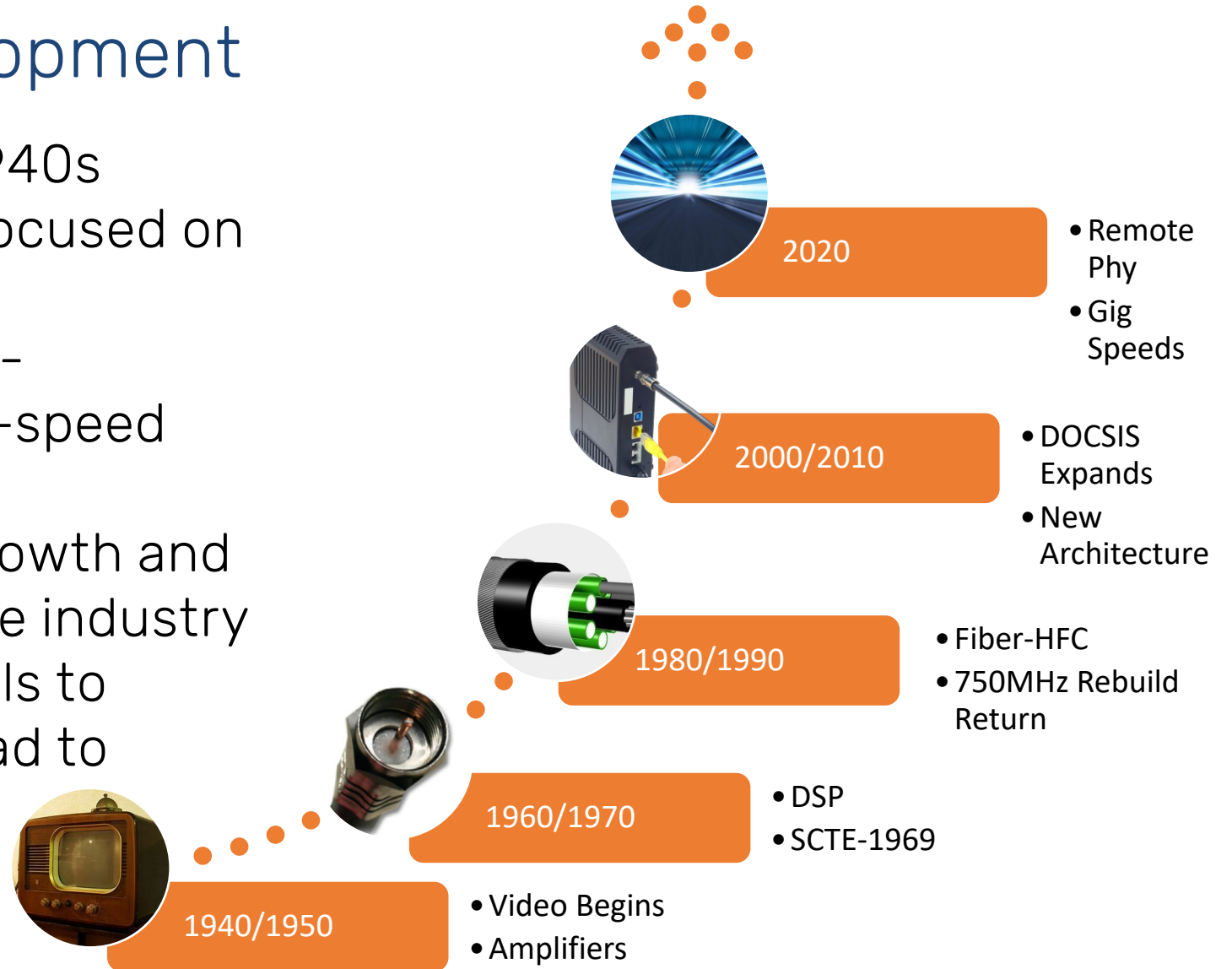
What is the tooling abyss and how is it created…..

- Centralized tooling system
  - Just create a new one for new technology
  - Departments within a centralize organization can be misaligned
- Decentralized tooling
  - Gap tool creation
  - Local team creation doing duplicate work
- Tool ownership conflict
  - Collaborative versus competitive strategy
- Cost impact
 - Inconsistency and duplication is costly
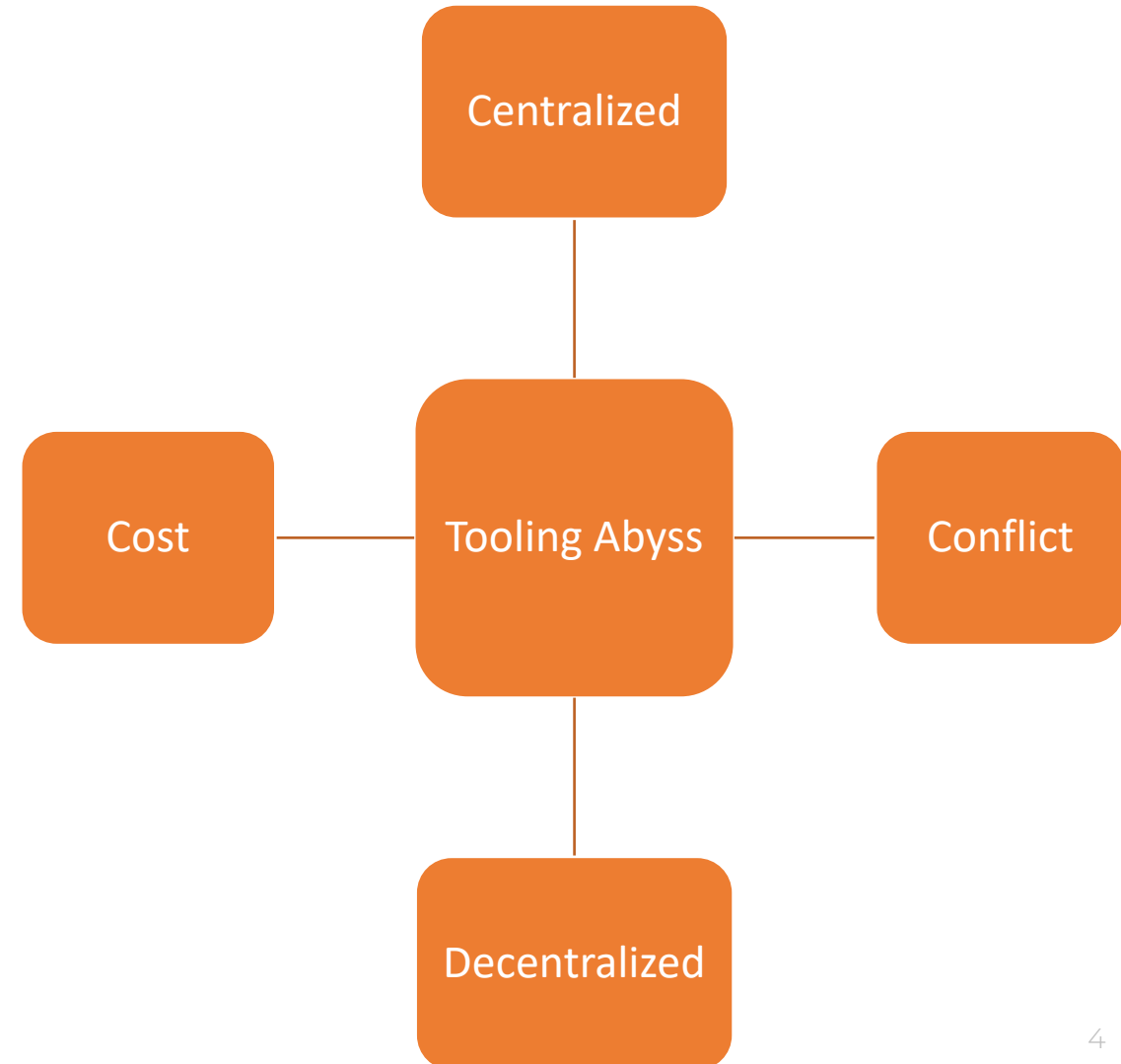
When is too much information or too many tools overwhelming for the user…

Multiple Tool Interfaces

- Building new tools without a strategy for the previous tool creates swivel

- Swiveling takes time away from tasks while users search for information

- Multiple tool interfaces requires multiple development teams to manage them

Adding Information

- New technology innovation drives new information into tools

- Information overload is a risk of the methodology of providing as much information as possible without consideration of the task

- Information avoidance is a result of information overload

Solution-Tooling Development Strategy
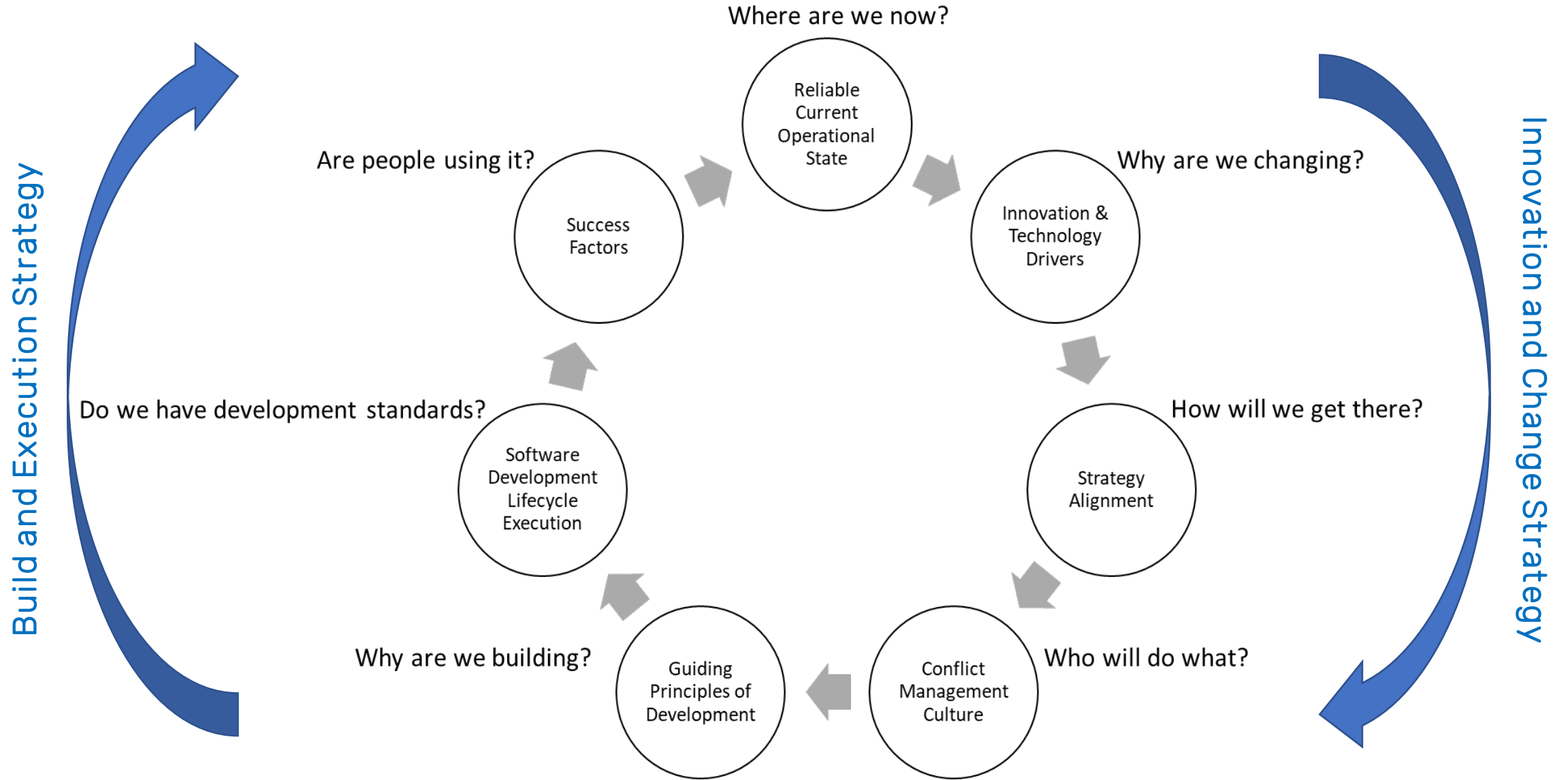
Tools are created and evolved to meet business needs….

| New Industry Technology	• Innovation changes tooling needs (Build new or add to existing) • Architecture evolution creating multiple structures to be supported
Tool Infrastructure Technology	• Reliability, planned upgrades, and technology obsolescence • Capacity growth and complexity of algorithms and data
Process Improvement	• Removing manual swivels between tool and creating automated flows • Process changes driven by evolving architecture
User Experience Enhancement	• Cost efficiency through technician time efficiency, time saved per task • Increased value by improving response time and ease of using UI

Balancing Strategic Pillars

Equally Balanced Collaboration

Engineering | Software | Finance | Operations
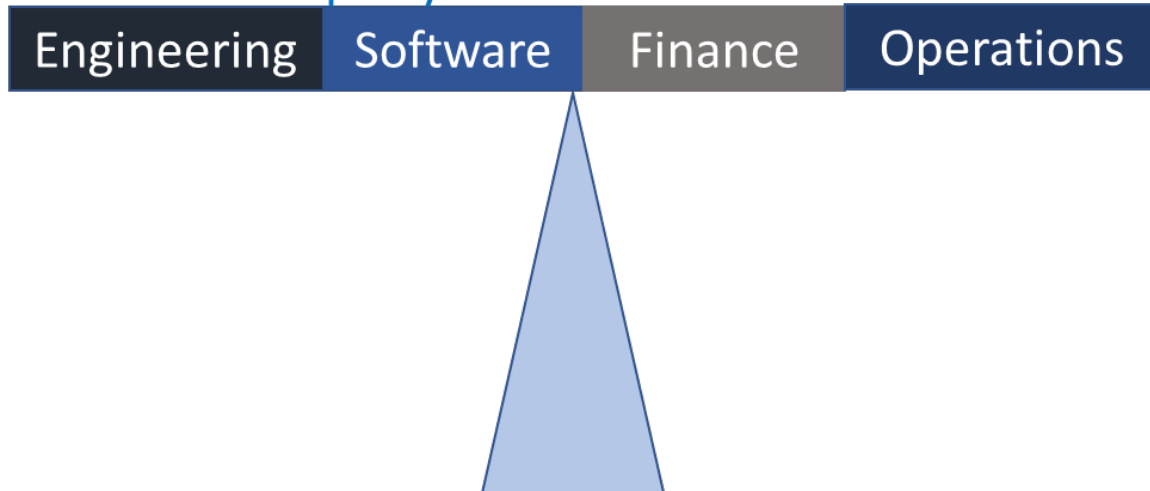
- Leadership alignment recognizing the importance of governance and accountability

- Four key balanced pillars
  - Core engineering (Product architecture)
  - Software development (Software standards)
  - Operations (Support and field operators)
  - Finance (ROI, budget, financial business value)

- Collaboration not competition achieves the strongest results

- Defined conflict management culture influences success and job satisfaction

Clear policy and strategy

Key Questions To Ask

- Is this requirement strategically aligned and governed?
- What is driving the change or the problem that needs to be solved?
- Who and what development team is responsible for solving it?
- How will the user behavior be influenced, and what is the behavioral expectation?
- How does this fit in the business financial model?
- Should this be developed internally or purchased?

Change Drivers

Development Responsibility

Organizational Behavior (Adoption)

Finance

Business Value Strategy

- Engineering Deployment Of New Technology
  - If tooling systems are not built or updated for the new technology, what experience would fail?
- Software Development
  - If there was no investment into the systems to modernize and grow in capacity, would the system tools become unreliable or unusable?
- Operational Requirements
  - How will requested features and functionality improve the user experience and drive business value?
  - Will there be improved efficiency or saved time per task and will they use it?
- Financial Requirements
  - Is there a positive return on investment (ROI) analysis of the cost to create the tool or enhancement compared to the value benefit for the business?
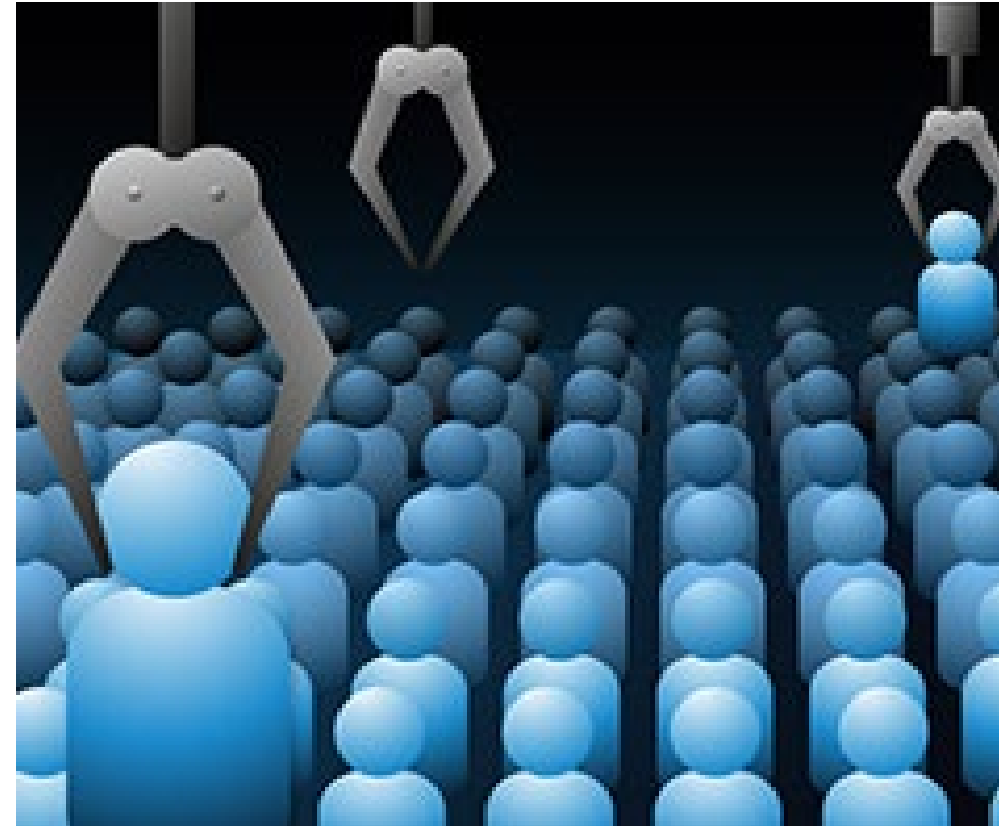
Successful Complex Integration

- Adoption is quick and utilization is high

- Business value, ROI is achieved, task time is reduced, and positive investment to the business

- Business behaviors, ensuring the expected changes in how users change and utilize to impact business metrics and customer satisfaction

- User feedback, user experience is being simplified, information is valuable and not overwhelming, and positive response from users

Conclusion

- How the tooling abyss is created
- Information overload and avoidance
- Aligned tool development strategy
- Balanced business pillars and value assessment
- Development principles and standards
- Success Factors