The Role of Product-Services Systems for Integrating Sustainability into R&D Decision-Making

HP Sustainability Innovation Workshop
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Strategic Challenge

PR|SM

- New business models for industry
  - Product Service Systems, Dematerialization, Servicizing
  - Reduce impact of consumables
  - Consumption not the end goal, but rather a means towards that goal
  - Focus on fulfilling real needs, not material needs

Research Questions

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- Is sustainability-driven innovation different than market-driven innovation and if so, what needs to change in our current R&D process in order to facilitate sustainability-driven innovation?
- Are fundamentally different business models needed (e.g. Servicing – Rothenberg, 2007) in order to reduce consumption levels and if so how does this impact current product development processes?
- What are the implications of environmental and social performance requirements on other systems requirements? Can the trade-off spaces be formally developed to help product development decision-makers?
- What is the environmental and social "footprint" of a particular technology and how can this information be integrated into R&D decisions?

Research Needs

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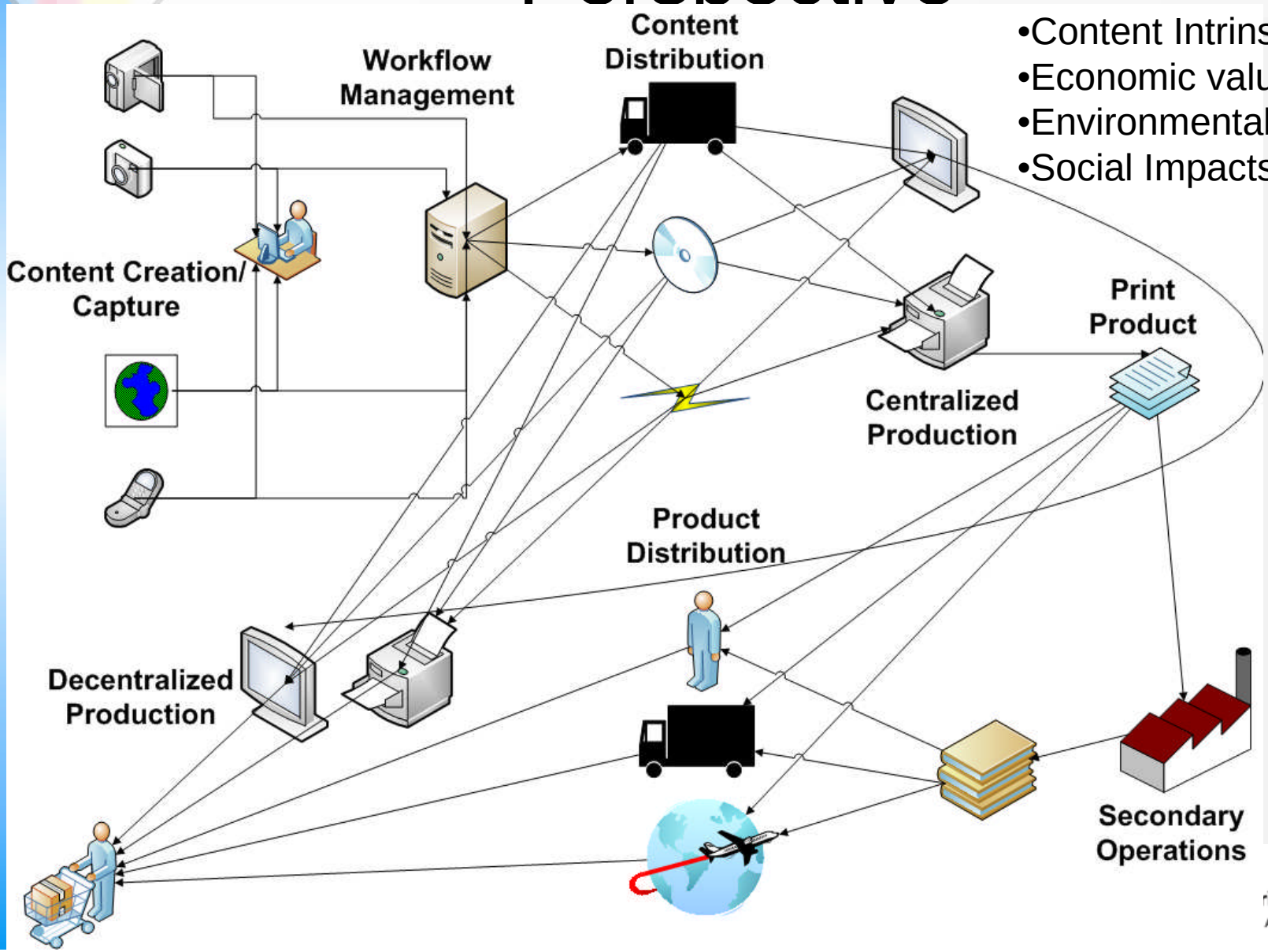
- Understanding and reducing environmental and negative social impacts of product service systems
- Overcoming significant organizational and cultural challenges at OEM, customer and across the supply chain
  - Different for different geographic regions
- Developing a more integrated approach to product design
- Identifying and developing use of IT and IT tools

Print Industry: Value Chain Perspective

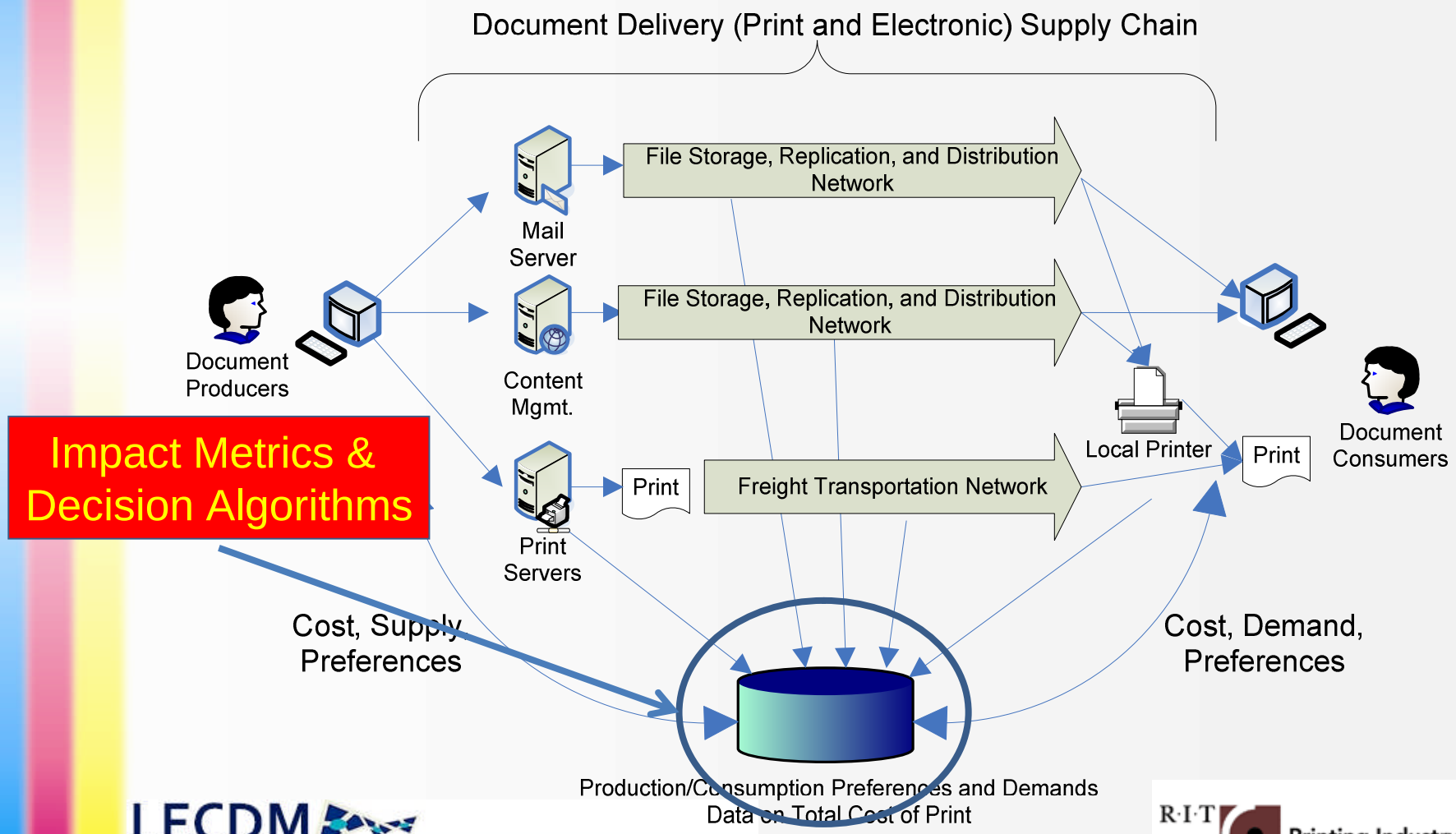
PRISM

Consider
- Content Intrinsic Value
- Economic value impacts
- Environmental impacts
- Social Impacts



Integrative IT Systems

PRISM



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RIT-wide & Print Industry Collaboration

PRISM

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Proposed Project Test Bed

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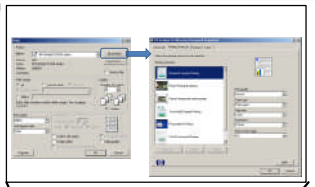
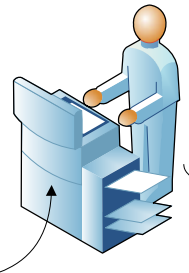


Print Life-Cycle Decision Tool

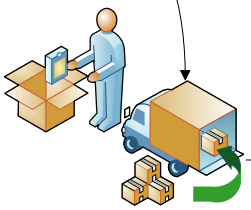


HUB Copy Center

Printing Alternatives vs. Impacts

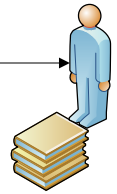
University Press

Graphic Design Alternatives vs. Impacts



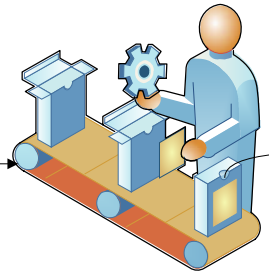
Mail Services

Packaging & Delivery Alternatives vs. Impacts



End User

Satisfaction &. Impacts



Print Applications Lab

Printing Alternatives vs. Impacts

LEC
The Labor

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Challenges and Opportunities

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- Feasibility of collecting data on and tracking where and when a document is created, printed, read on a computer, duplicated, stored, deleted, and recycled
- Structure and form of computational models that build and calibrate life-cycle costs of document production, distribution, storage, and consumptions
  - Integrate print material supply chain models and electronic document delivery supply chain models
- Can consumers and providers in the service supply chain state mutual needs and preferences so they can collaborate to improve economic and environmental performance?

Innovation Dynamics & Sustainability

PRISM

- Additional Challenges
  - added constraints of environmental and social pressures
  - incorporating the needs of future generations
  - higher levels of uncertainty
  - wider range of stakeholders
  - systemic nature of sustainability

Are new models for innovation and product development processes required for sustainable development?

Conclusions

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- New Business Models
- New Product Development Models
- Modeling Consumption Patterns
- Experimental Test-bed Approach
  - Tools for consumer choice
  - Integrate multiple metrics

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