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COLLEGE OF TECHNOLOGY

SIX SIGMA AND OPEN INNOVATION

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SIX SIGMA DEFINITION

THE PROJECT MANAGEMENT METHODOLOGY - DMAIC

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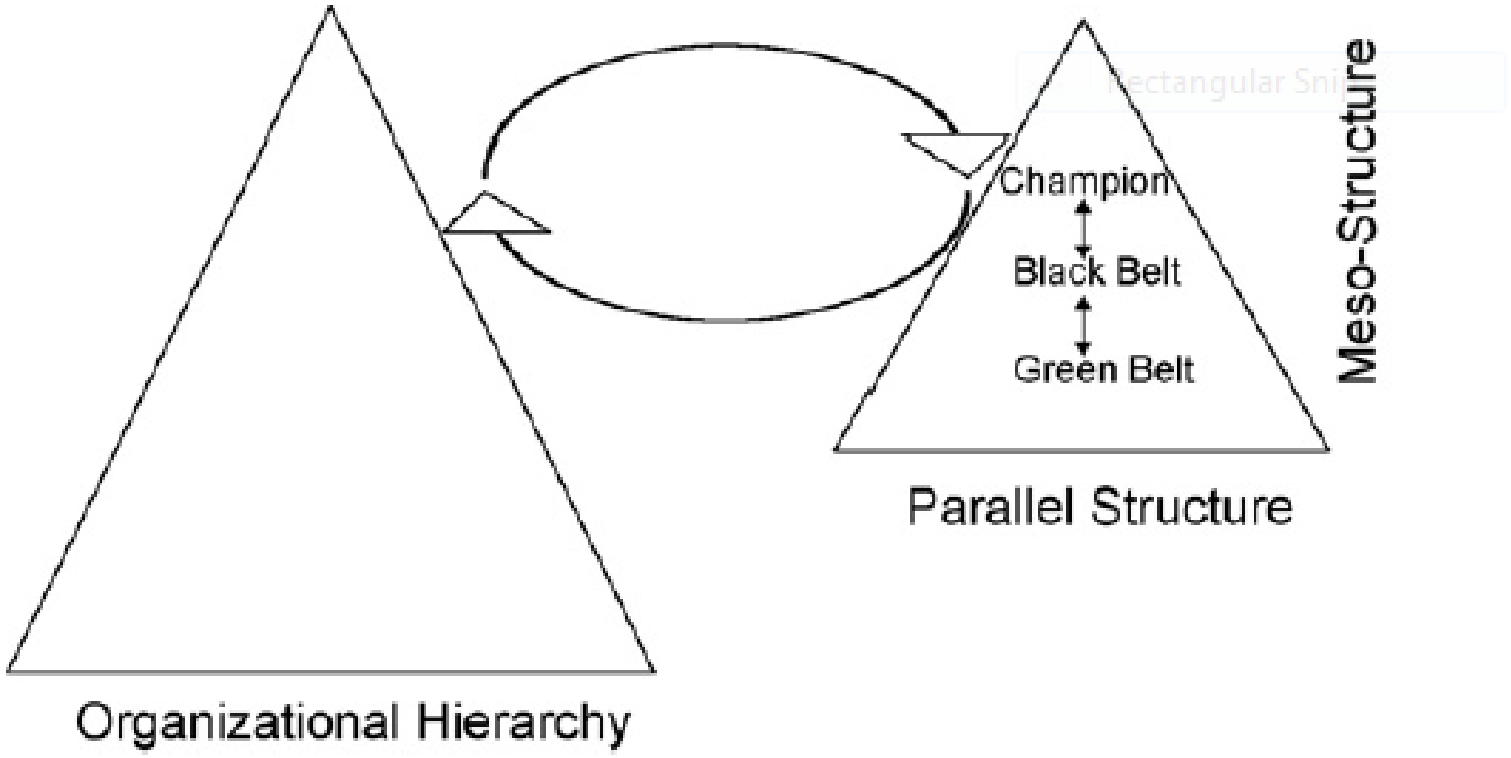
SIX SIGMA STRUCTURE



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SIX SIGMA LIMITATIONS

PROBLEMS IN THE DISCIPLINE

Relies on measureable

Attention on repetitive

Prevention

Unrealistic statistical models, 1.5 shift

Focus on expected

Current state

Almost no emphasis on self learning, or adaptation

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DISRUPTIVE INNOVATIONS & TECHNOLOGIES

"Disruptive Technologies: Advances That Will Transform Life, Business and the Global Economy."

**The McKinsey Global Institute

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INNOVATION

"Innovations are new creations of economic or societal significance mainly carried out by firms (but not necessarily in isolation). They may be new products or new processes. New products may be material goods or intangible services. New processes may be technological or organizational; it is a matter of how the products are produced."

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DISRUPTIVE INNOVATIONS & TECHNOLOGIES

Mobile Internet

Automation of Knowledge Work

Internet of Things

Cloud

Advanced Robotics

Autonomous and Near-Autonomous Vehicles

Next-Generation Genomics

Energy Storage

3-D Printing

Advanced Materials

Advanced Oil and Gas Exploration and Recovery

Renewable Energy

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OPEN INNOVATION

"A paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market."

"Innovating with partners by sharing risk and sharing rewards."

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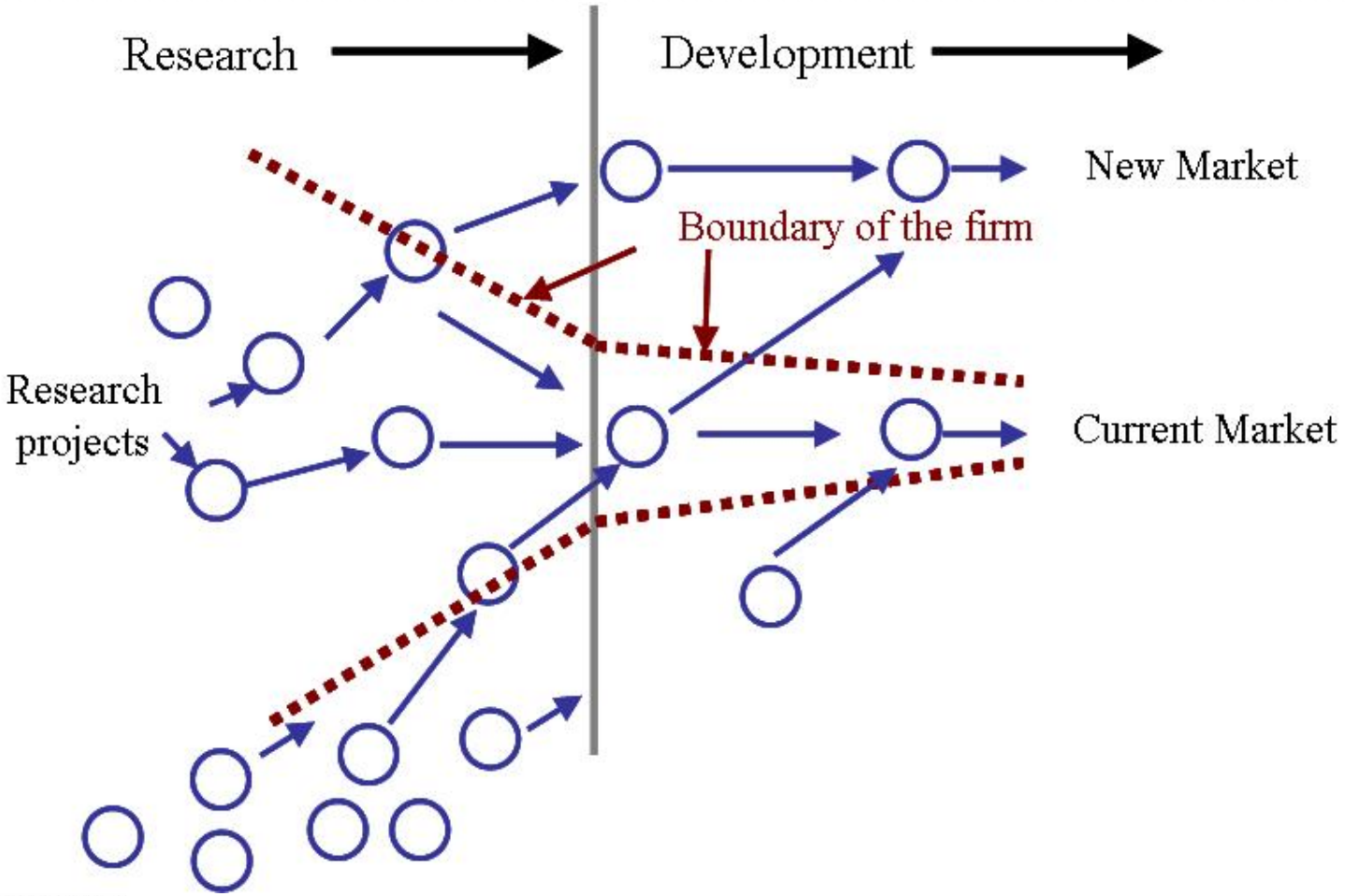
OPEN INNOVATION MODEL

INCREASING AREA OF RESEARCH



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INNOVATION (OPEN)

DEFINITION

Use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand markets for external use of innovation respectively

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- Structural Perspective – drivers are cost reduction and greater specialization due to advances in technology
- User Perspective – Important to integrate users early in the innovation process
- Supplier Perspective – Integrating and including suppliers early innovation process
- Leveraging Perspective – The potential compounding effect of intellectual property
- Tools Perspective – Tools an processes for producing products and services
- Cultural Perspective – Values of the organization and leadership in the industry and community

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SIX SIGMA AND INNOVATION

LITERATURE REVIEW

How innovation is defined matters (technical, organizational, etc.)

Confusion may occur based upon innovation process (or lack thereof)

Innovation requires flow and sequence (process)

Positive relationship between organizational learning, a pre-condition for innovation (general), and Six Sigma

Nearly all studies do not recognize the open/closed innovation characteristic

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STUDY OBJECTIVE

PREMISE

The prescriptive S.S. methodology, DMAIC, gives considerable autonomy to teams to develop innovative solutions

How innovation (open) and SS get defined is critical to studying both

Comprehensive framework of SS and Open Innovation missing

Critical Success Factors (CSF's) may serve as a common model for SS and Open Innovation

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CRITICAL SUCCESS FACTORS

BASIS FOR COMMON STRATEGIC MODEL

Critical Success Factor	Definition
Project selection	The organization identifies and manages Six Sigma projects based upon company critical success factors
Six Sigma training	Personnel are trained as in multiple roles (SSBB, SSGB, etc.) for comprehensive deployment
Six Sigma tool utilization	Quantitative and other methods are used by experts for the purpose of completing SS projects
Project management/execution	Six Sigma projects are managed according to project management principles and executed through a strong process management orientation
Six Sigma framework	Six Sigma deployment is conducted as projects and follow specific methodologies (DMAIC, DMADV, DFSS), through roles, and as a meso-structure
Project alignment to business plan and customers	Project outcomes incorporate organizational CSF's for direct 'line of sight' between projects and strategy
Leadership commitment and participation	Technical leadership is practiced across all organizational levels to facilitate change in the organization

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SIX SIGMA AND OPEN INNOVATION

ENHANCING OPEN INNOVATION

Low success rate of innovation projects – process view (BPM) needed like Six Sigma rigor

Business process management (BPM) orientation has long been incorporated into DMAIC methods through understanding work in a process view - flow of activity is organized, measured, and monitored.

DMAIC tools enhance open innovation - development phase for eventual commercialization.

Disruption and sustaining are two characteristics required for any organization to not only harness, but to balance through organizational management

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SIX SIGMA AND OPEN INNOVATION

IMPROVING SIX SIGMA

Six Sigma weakness has been that the model is more ‘closed’ with focus on focusing existing requirements rather than a growth orientation

Both Open Innovation and Six Sigma have voice of the customer (VOC) orientation.

DMAIC should incorporate more divergent thinking, especially in the Improve phase, such as Open Innovation model

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CONCLUSIONS

Strategic, rather than tactical relationship

Six Sigma and Open Innovation recognized as related, but separate disciplines that requires expertise, often initially employed from outside the organization

Critical Success Factor model may enhance both disciplines, especially Open Innovation

Placing Six Sigma within the overall lifecycle of Open Innovation may occur

Open Innovation and Six Sigma are change processes that serve the organization's sustainability

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THANK YOU

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