Sustainability and Sustainable Business Models

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Version 2 (31.03.2022)

Citation: Strupeit, L. (2022). Sustainability and Sustainable Business Models. Lund, Sweden.

Sustainability and SBM

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Sustainable development: "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." (WCED, 1987)

- Technologies, products, business models and design that contribute to achieving the UN Sustainable Development Goals.

Sustainable Business Model (SBM): one that allows a combination of economic, environmental and social aspects of sustainability to define the organization's purpose

- Aims at reducing negative impacts for the environment and society.

SBM value mechanisms and archetypes

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SBMs enable transitions to sustainability by addressing social, environmental and economic concerns, coupled with a strong customer offering.

SBM definition

SBMs draw on economic, environmental and social aspects of sustainability in defining an organization's purpose; use a triple bottom line (people, profit, planet) approach in measuring performance; consider the needs of all stakeholders rather than giving priority to shareholder expectations; treat 'nature' as a stakeholder and promote environmental stewardship; and encompass a system, as well as a firm-level perspective

Types of SBMs (examples)

1. Maximizing material and energy efficiency.
2. Closing resource loops.
3. Substituting with renewables and natural processes.
4. Delivering functionality rather than ownership.
5. Adopting a stewardship role.
6. Encouraging sufficiency
7. Repurposing the business for society/environment
8. Seeking inclusive value creation
9. Developing sustainable scale-up solutions.

Value mechanisms (and components) of SBMs

- Value proposition (*What value is provided and to whom?)*
- Value creation and delivery (*How is value provided?*)
- Value capture (*How does the company make money and capture other forms of value?*)

Multiple perspectives of SBMs

- Micro level (company and customer)
- Meso level (eco-industrial parks and value chains)
- Macro level (cities, regions, and nations)

Barriers (examples)

1. Fierce competition
2. Cognitive barriers
3. Lack of government support

Opportunities (examples)

1. Smart utilization of resources and waste
2. Cooperation
3. Consumer involvement

Defining characteristics of SBM

- A SBM draws on economic, environmental and social aspects of sustainability in defining an organization's purpose
- A SBM Uses a Triple Bottom Line (TBL) approach in measuring performance
- A SBM considers the needs of all stakeholders rather than giving priority to shareholders' expectations
- A SBM treats nature as a stakeholder and promotes environmental stewardship
- Sustainability leaders, or champions, drive the cultural and structural changes necessary to implement sustainability
- An SBM encompasses the systems perspective as well as the firm-level perspective

Source: Stubbs, W., & Cocklin, C. (2008). Conceptualizing a 'sustainability business model'. Organization & Environment, 21(2), 103-127.

Sustainable business model canvas

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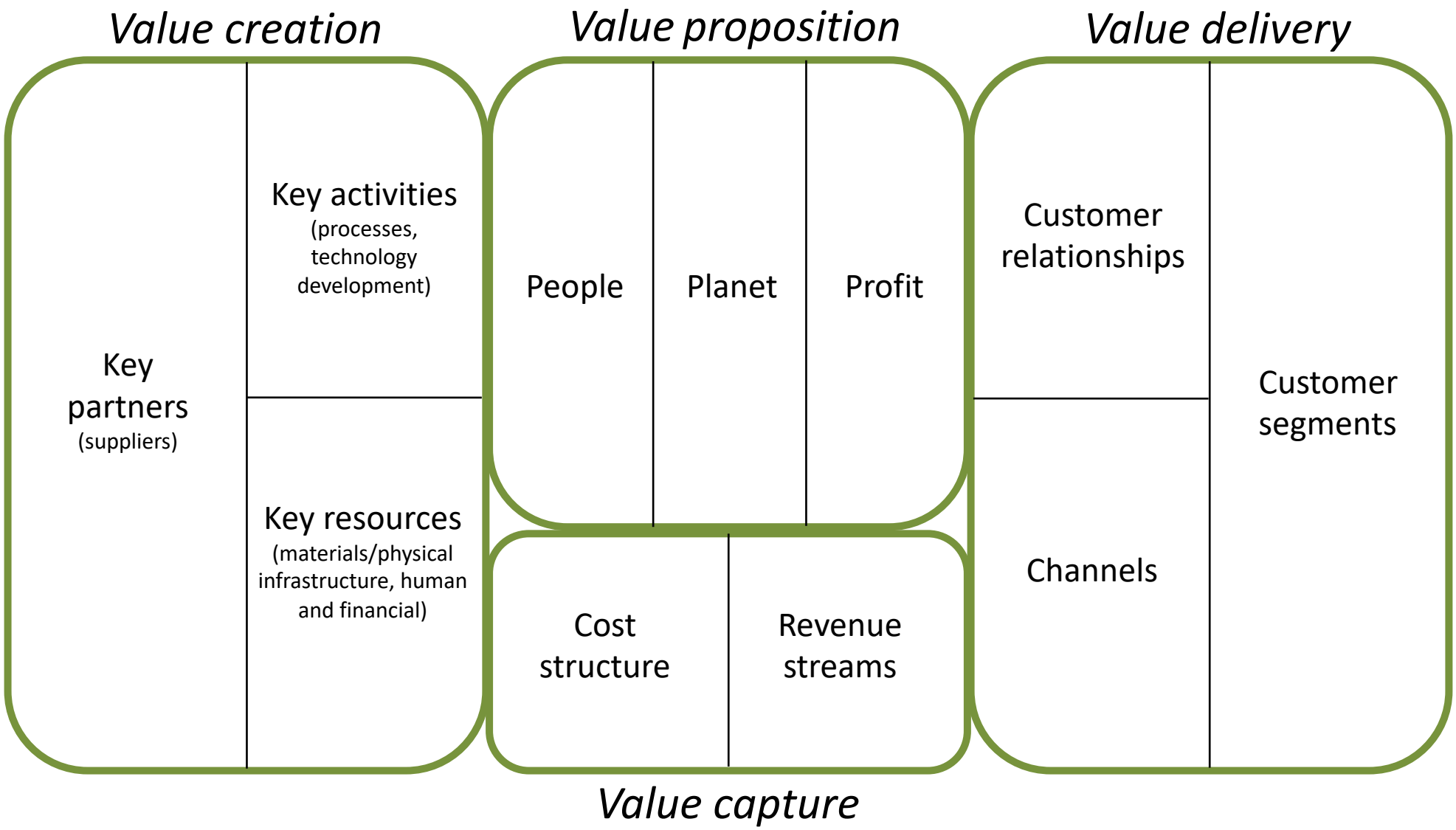

Adapted from: www.strategyzer.com / Osterwalder (2010)

SBM types (I): Maximizing material and energy efficiency

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Do more with less resources, generate less waste, emissions, pollution

Examples

- De-materialization
- Low-carbon solutions
- Low carbon manufacturing
- Increased functionality
- Lean manufacturing

Value mechanisms

Value proposition	Value creation & delivery	Value capture
Products or services that use fewer resources, generate less waste and emissions and create less pollution than products/ services that deliver similar functionality.	Activities and partnerships aimed at using fewer resources and generating little waste, emissions and pollution. Focus is on product and manufacturing process innovation, but may extend to wider changes. New partnerships and value network reconfigurations to improve efficiencies and reduce supply chain emissions (e.g. transport).	Costs are reduced through the optimised use of materials and reducing waste, and compliance leading to increased profits and competitive pricing advantage. Positive contribution to society and environment through a minimised environmental footprint.

Bocken, Short, Evans (2014)

Suggested readings

Weizsäcker, E., von Lovins, A., Lovins, L., 1997. Factor Four: Doubling Wealth - Halving Resource Use: The New Report to the Club of Rome. Earthscan Publications Ltd, London.

Diaz Lopez, F. J., Bastein, T., & Tukker, A. (2019). Business model innovation for resource-efficiency, circularity and cleaner production: What 143 cases tell us. Ecological Economics, 155, 20-35.

SBM types (II): Closing resource loops

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Turn waste streams into resources for other products and processes

Examples

- Circular economy, closed loop
- Industrial symbiosis
- Cradle-2-cradle
- Reuse, recycle, remanufacture
- Take-back management

Value mechanisms

Value proposition

The concept of 'waste' is eliminated by turning existing waste streams into useful and valuable input to other production.

Value creation & delivery

Activities and partnerships to eliminate life cycle waste, close material loops and make best use of under-utilised capacity. Introduction of new partnerships (e.g. recycling firms), potentially across industries, to capture and transfer waste streams.

Value capture

Economic and environmental costs are reduced through reusing material, and turning waste into value. Positive contribution to society and environment through reduced footprint, reduced waste and reduced virgin materials use.

Bocken, Short, Evans (2014)

Suggested readings

Geissdoerfer, M., Savaget, P., Bocken, N. M., & Hultink, E. J. (2017). The Circular Economy–A new sustainability paradigm?. Journal of cleaner production, 143, 757-768.

Ellen MacArthur Foundation: www.ellenmacarthurfoundation.org/

SBM types (III): Substituting with natural and renewable processes

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Substitute with ‘green’ energy and use processes with reduced emissions

Examples

- Move from non-renewable to renewable energy sources
- Bioeconomy
- Zero emissions initiative

Value mechanisms

Value proposition	Value creation & delivery	Value capture
Reduce environmental impacts and increase business resilience by addressing resource constraints associated with non-renewable resources and man-made artificial production systems.	Innovation in products and production process design by introducing renewable resources and energy and conceiving new solutions by mimicking natural systems. New value networks based on renewable resource supply and energy systems. New partnerships to deliver holistic 'nature inspired' solutions.	Revenue associated with new products and services. Value for the environment is captured through reducing use of non-renewable resources, reducing emissions associated with burning fossil fuels, reducing synthetic waste to land-fill.

Bocken, Short, Evans (2014)

Suggested readings

Burger, S. P., & Luke, M. (2017). Business models for distributed energy resources: A review and empirical analysis. *Energy Policy, 109*, 230-248

Salvador, R., Puglieri, F. N., Halog, A., Andrade, F. G. D., Piekarski, C. M., & De Francisco, A. C. (2021). Key aspects for designing business models for a circular bioeconomy. *Journal of Cleaner Production, 278*

SBM types (IV): Delivering functionality rather than ownership

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Provide services that satisfy user needs without having to own physical products

Examples

- Product-oriented product-service system: maintenance, extended warrantee
- Use-oriented product-service system: rental, lease, shared
- Result-oriented product-service system: pay-per-use

Value mechanisms

Value proposition	Value creation & delivery	Value capture
Provide services that satisfy user needs without users having to own physical products. Business focus shifts from manufacturing 'stuff' to maximising consumer use of products, so reducing production throughput of materials, and better aligning manufacturers' and consumers' interests.	Delivery through product/service offerings require significant changes within the firm to deliver this and may incentivise redesign for durability, reparability and upgradability. Potentially, more direct consumer contact and consumer education to shift away from ownership. Supply chains become more integrated.	Consumers pay for the use of the service, not for ownership of products. Cost of ownership of physical products are borne by the company and/ or partners. This can enable consumers to access previously expensive products, so expanding the market potential of new innovations.

Bocken, Short, Evans (2014)

Suggested readings

Tukker, A. (2004). Eight types of product–service system: eight ways to sustainability? Experiences from SusProNet. Business strategy and the environment, 13(4), 246-260.

Reim, W., Parida, V., & Örtqvist, D. (2015). Product-service systems (PSS) business models and tactics - A systematic literature review. *Journal of Cleaner Production, 97*, 61-75.

SBM types (V): Adopting a stewardship role

Deliver social and environmental benefits, rather than economic profit maximisation

Examples

- Biodiversity protection
- Ethical trade (fair trade)
- Consumer care – promote consumer health and well-being
- Radical transparency about environmental / societal impacts
- Choice editing by retailers

Value mechanisms

Value proposition	Value creation & delivery	Value capture
Manufacture and provision of products and services intended to genuinely and proactively engage with stakeholders to ensure their long-term health and well-being. Broader benefits to stakeholders often become an important aspect of the value proposition by better engaging the consumer with the full story of production and the supply chain.	Ensuring activities and partners are focused on delivering stakeholder health and well-being. Production systems and suppliers selected to deliver environmental and social benefits. Network reconfiguration may require alternative suppliers. To achieve scale, use of third-party certification may facilitate implementation and monitoring.	Stewardship strategies can generate brand value and potential for premium pricing. Stakeholder well-being and health generate long-term business benefits for the company: Healthy customers are good for the firm and for society, healthy happy workers may claim less sick days and may be more productive, and secure suppliers ensure more resilience.

Bocken, Short, Evans (2014)

Suggested readings

Bocken, N., Short, S., Rana, P., Evans, S. 2014. A literature and practice review to develop Sustainable Business Model Archetypes. Journal of Cleaner Production, 65, 42–56

Hickle, G. (2007). Promoting product stewardship with eco-labels, certification programs, and product standards. *Environmental Quality Management, 16*(3), 1-9.

SBM types (VI): Encouraging sufficiency

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Seek to reduce consumption and production

Examples

- Consumer education / communication
- Product longevity
- Slow fashion
- Premium branding / limited availability
- Demand management
- Frugal business

Value mechanisms

Value proposition	Value creation & delivery	Value capture
Product and service solutions that seek to reduce demand-side consumption and hence reduce production (e.g. durable, modular, education about reduced consumption). The focus of such innovation is on the customer relationship and influencing consumption behaviour.	Ensuring activities, partners and customer relations are focused on consuming less, wasting less, and using products longer. This may involve product redesign for durability. It will require a fundamental shift in promotion and sales (no discounting, overselling); supplier selection based on durability; and incentive systems to discourage 'over-selling' / obsolescence.	Profitability (premium pricing), customer loyalty, and increased market share realised from provision of better products (longer lasting, durable/ not subject to short fashion-cycles). Societal and environmental benefits captured: educated society, using less product, reuse across generations.

Bocken, Short, Evans (2014)

Suggested readings

Bocken, N. M., & Short, S. W. (2016). Towards a sufficiency-driven business model: Experiences and opportunities. Environmental Innovation and Societal Transitions, 18, 41-61

Niessen, L., & Bocken, N. M. P. (2021). How can businesses drive sufficiency? the business for sufficiency framework. Sustainable Production and Consumption, 28, 1090-1103

SBM types (VII): Repurposing the company for society and environment

Integrate business in local communities through employee ownership and collaborative approaches

Examples

- Not for profit
- Hybrid businesses, social enterprise (for profit)
- Social and biodiversity regeneration initiatives
- Alternative ownership: cooperative, mutual, collectives

Value mechanisms

Value proposition

Prioritising delivery of social and environmental benefits rather than economic profit (i.e. shareholder value) maximisation, through close integration between the firm and local communities and other stakeholders.

Value creation & delivery

Creating societal benefits (e.g. secure livelihoods), and environmental benefits (e.g. regenerating flora and fauna) through activities, channels and partners. Integrating business with stakeholders through participatory business approaches, which may include non-traditional business partnerships (e.g. NGOs) and embracing employee ownership.

Value capture

A meaningful enterprise, which delivers nutrition, health, and education at a low environmental cost, while being embedded in community and employment rich. This may provide resilience by supporting stakeholders in times of growth and downturn.

Bocken, Short, Evans (2014)

Suggested readings

Santos, F., Pache, A. -., & Birkholz, C. (2015). Making hybrids work: Aligning business models and organizational design for social enterprises. *California Management Review, 57*(3), 36-58.

Doherty, B., Haugh, H., & Lyon, F. (2014). Social enterprises as hybrid organizations: A review and research agenda. *International Journal of Management Reviews, 16*(4), 417-436.

SBM types (VIII): Inclusive value creation

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Sharing resources, knowledge, ownership, and wealth creation

Examples

- Collaborative approaches (sourcing, production, lobbying)
- Peer-to-peer sharing
- Inclusive innovation
- Base of pyramid solutions

Suggested readings

Prahalad, C. K. (2012). Bottom of the Pyramid as a Source of Breakthrough Innovations. *Journal of Product Innovation Management*, *29*(1), 6–12.

Novikov, O. (2022). *Peer-to-Peer Business Model: Navigating between Social and Economic Pressures*. International Journal of Trade, Economics and Finance *13*(2), 4

SBM types (IX): Deliver sustainable scale-up solutions

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Deliver sustainable solutions at a large scale to maximise benefits for society and the environment

Examples

- Impact investing
- Patient / slow capital
- Peer-to-peer lending
- Crowdsourcing funding
- Open innovation (platforms)
- Incubator and entrepreneur support models

Value mechanisms

Value proposition	Value creation & delivery	Value capture
Scaling sustainability solutions to maximise benefits for society and the environment.	Ensuring a sustainable business model solution can achieve scale by employing the right channels, and partnering with others. New, and potential unusual partners (e.g. government for infrastructure change) and business relationships are required to scale the business.	Ensuring a variable (e.g. franchising, licensing) or fixed (mergers and acquisitions) fee is paid for scaling up a solution/ venture and that other mutual benefits between partners are achieved through scaling up (e.g. market penetration).

Bocken, Short, Evans (2014)

Suggested readings

Messeni Petruzzelli, A., Natalicchio, A., Panniello, U., & Roma, P. (2019). Understanding the crowdfunding phenomenon and its implications for sustainability. *Technological Forecasting and Social Change, 141*, 138-148.

SBM types: Summary

	ENVIRONMENTAL			SOCIAL			ECONOMICAL		
	1. Maximizing material and energy efficiency	2. Closing resource loops	3. Substituting with renewables and natural processes	4. Delivering functionality, not ownership	5. Adopting a stewardship role	6. Encouraging sufficiency	7. Repurposing for society/ environment	8. Inclusive value creation	9. Developing sustainable scale-up solutions
Short definition	Do more with fewer resources. Generate less waste, emissions, and pollution.	Reuse materials and products. Turn waste into feedstocks for other products/ processes.	Use of non-finite materials and energy sources.	Provide services that satisfy users' needs without their having to own physical products.	Proactively engage with all stakeholders to ensure their long-term health and well-being.	Solutions that actively seek to reduce end-user consumption.	Seek to create positive value for all stakeholders, in particular society and environment.	Sharing resources, knowledge, ownership, and wealth creation. Inclusive value generation.	Delivering sustainable solutions at a large scale to maximize benefits for society and the environment.
Innovations within this archetype	Lean manufacturing. Dematerialization. Increased functionality.	Cradle-to-cradle. Industrial symbiosis. Extended producer responsibility.	Cleantech. Renewable energy (e.g. solar, wind). Biomimicry.	Rental/lease. Pay per use. Product-service combinations.	Community development. Biodiversity protection. Choice editing.	Consumer education. Demand management. Slow fashion. Frugal businesses.	Social enterprises and benefit-corporations. Non-profits. Hybrid models. Net positive initiatives.	Collaborative platforms. Collaborative consumption. Peer-to-peer and sharing models.	Open innovation platforms. Incubators. Slow/patient capital.
Typical positive impacts	Enhance efficiency and improve resource use. Save costs.	Reduce waste. Turn waste into value/new business lines. Generate new revenue streams.	Reduces use of finite resources, waste, and pollution. Supports long-term energy supply. Contributes to "green economy."	Can encourage the right behaviours with manufacturers and users. Can reduce the need for physical good.	Ensure long-term well-being of planet (e.g. forests) and society (e.g. health). Ensure long-term viability of the value network.	Actively reduce consumption. Encourage community sufficiency, sustainable living. Build long-term customer loyalty, and new repair and service markets.	Deliver positive societal (e.g. community development) value. Deliver positive environmental (e.g. afforestation) value. Prepare for a resource capacity for long-term business sustainability.	Share resources, skills, and knowledge, and distribute wealth. Leverage resources and talents. Create new business opportunities.	Achieve scale from small sustainability pilot or start-up to large-scale project or business. Create industry-wide change for sustainability. Create breakthrough innovation.
Possible negative side effects	May generate incremental change only. May lead to rebound effects. May lead to job losses.	May lead to quicker sales cycles and more material use. May sustain waste streams because waste = value.	"Carbon lock-in" and NIMBY prevent uptake. Embedded footprint of production (e.g. solar panels). Lack of recyclability consideration of (solar-based) products.	More product/ service usage. If not combined with efficiency improvements, it may have negligible environmental impact improvement.	More product/ service usage. If not combined with efficiency improvements, it may have negligible environmental impact improvement.	Potential price premium for consumers. Remaining niche because it goes against "growth" principles.	Potential to remain niche without policy changes. Potential to remain niche within current capitalist framework.	If not combined with efficiency improvements, it may lead to limited environmental improvement. May induce more product/service use due to wider accessibility.	Focus on scale might detract from sustainability purposes. Risk of unproven radical innovation.

Lüdeke-Freund, F., Massa, L., Bocken, N., Brent, A., & Musango, J. (2016)

The role of IP in the SBM

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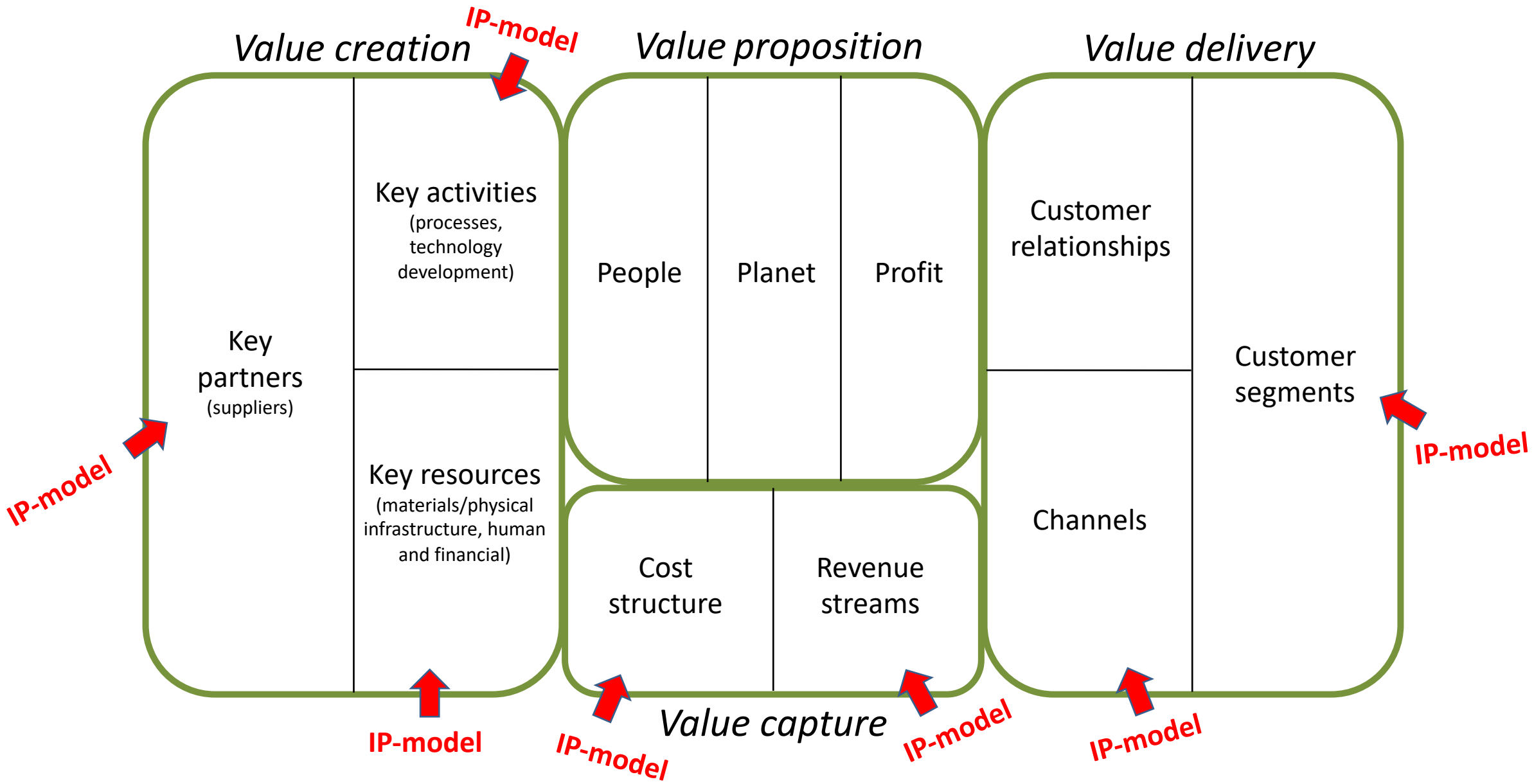

Adapted from: www.strategyzer.com / Osterwalder (2010)

The role of IP in the SBM

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A firm's IP model (or IP portfolio) affects the various building blocks of a (sustainable) business model in various ways

Key partners
- Example
- Example

Key activities
- Example
- Example

Key resources
- Example
- Example

Cost structure
- Expenditure for patents
- Expenditure for in-licensing

Revenue streams
- Expenditure for out-licensing
- Example

Channels
- Example
- Example

Customer segments
- Example
- Example

Literature for further reading

- Adams, R., Jeanrenaud, S., Bessant, J., Denyer, D., & Overy, P. (2016). Sustainability-oriented innovation: a systematic review. International Journal of Management Reviews, 18(2), 180 205.
- Bakker, C., Wang, F., Huisman, J., & den Hollander, M. (2014). Products that go round: exploring product life extension through design. Journal of Cleaner Production, 69, 10-16.
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- Tukker, A., Bulavskaya, T., Giljum, S., de Koning, A., Lutter, S., Simas, M., ... & Wood, R. 2016. Environmental and resource footprints in a global context: Europe's structural deficit in resource endowments. Global Environmental Change, 40, 171-181.

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Funding support: The project IPACST is financially supported by the Belmont Forum and NORFACE Joint Research Programme on Transformations to Sustainability, which is co-funded by DLR/BMBF FONA-SÖF 01UV1812A and 01UV1812B, GCRF, ESRC (ES/S008322/1), VR 2017-06439, and the European Commission through Horizon 2020.

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