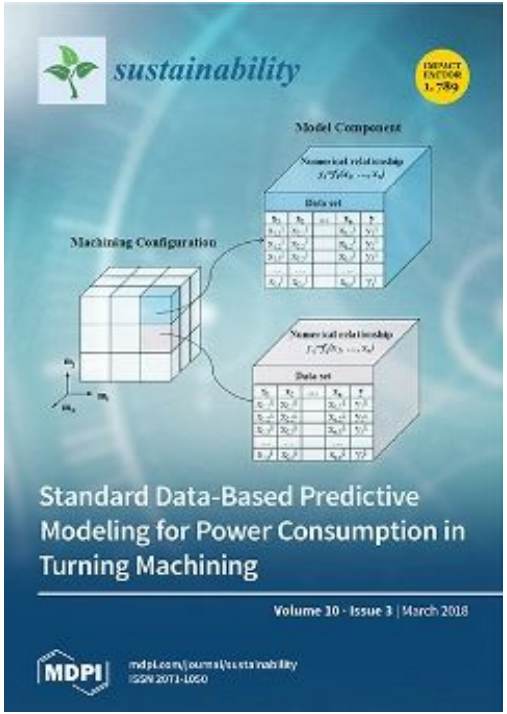

Artigo

Exploring How Usage-Focused Business Models Enable Circular Economy through Digital Technologies

Discente

Amanda Daniele de Carvalho

EESC • USP
Escola de Engenharia de São Carlos
Universidade de São Paulo

Autores

Gianmarco Bressanelli

Federico Adrodegari

Marco Perona

Nicola Saccani

EESC • USP
Escola de Engenharia de São Carlos
Universidade de São Paulo

Instituição

RISE
Research & Innovation for Smart Enterprises
www.rise.it

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Elementos do artigo

Questão de pesquisa

Como as novas tecnologias digitais (IoT, Big Data e analytics) atuam na implantação de BMs focados no uso para aumentar a eficiência dos recursos, prolongar a vida útil do produto e fechar o loop, atingindo os drivers fundamentais de valor da Economia Circular?

Foco (escopo)

Os autores identificam e exploram empiricamente, por meio de um estudo de caso, oito funcionalidades de Business Models focados no uso, habilitados por tecnologias digitais, evidenciando como eles sustentam a transição para a Economia Circular. Os autores formalizam os resultados por meio do desenvolvimento de um conceptual framework.

Objetivo geral

Contribuir com a construção de conhecimento sobre a forma como as tecnologias digitais podem acelerar a implantação de BMs servitizados e a transição para CE.

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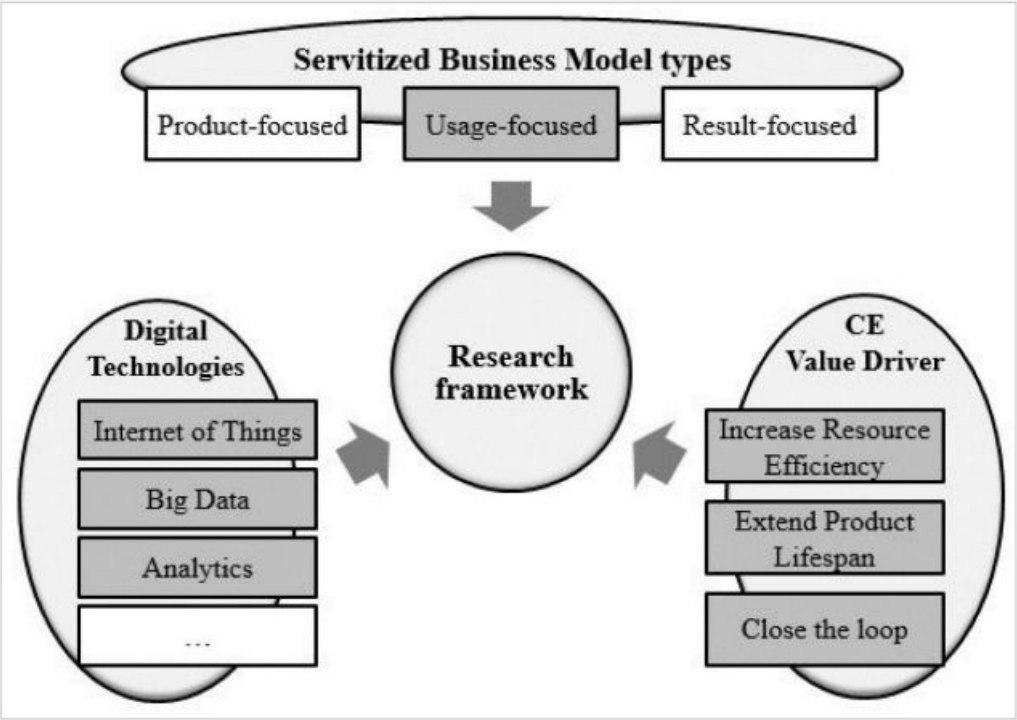
Metodologia



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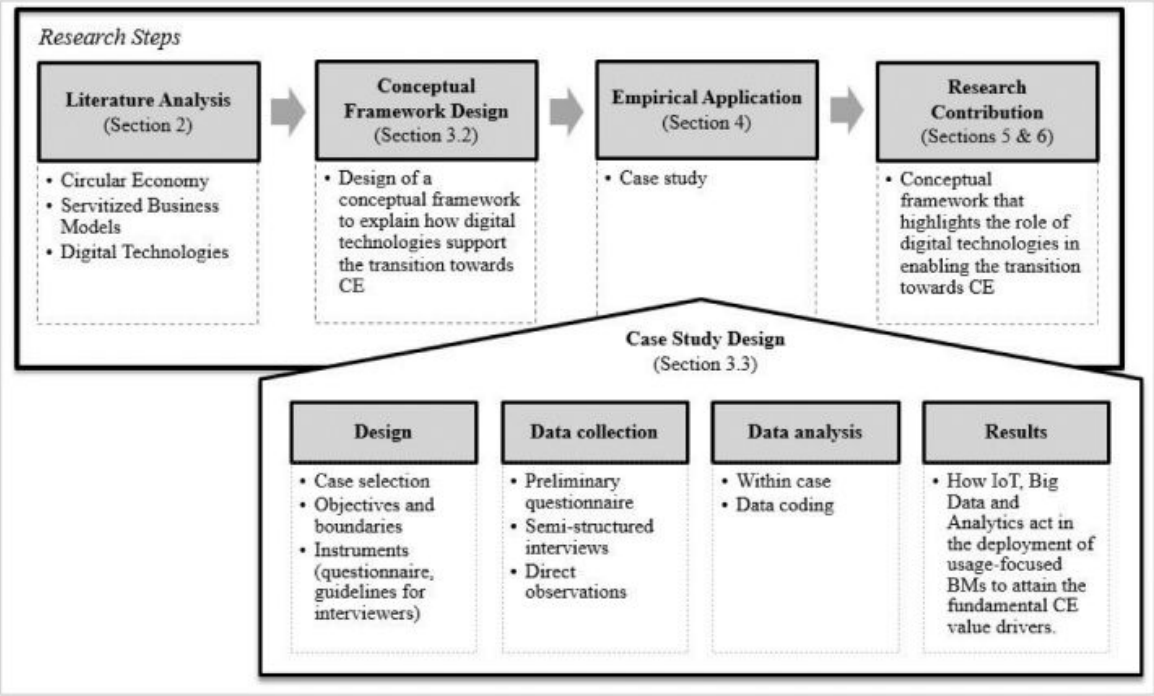
Metodologia



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Principais conceitos

Circular Economy

- ➔ Ellen MacArthur Foundation: “system restorative and regenerative by design, which aims to maintain products, components and materials at their highest utility and value”; (p.2)
- ➔ CE implementation projects may take place at three different implementation levels, which differ by their scale and unit of analysis: micro, meso, and macro; (p.3)
- ➔ The implementation of CE may follow a top-down or a bottom-up approach. (p.3)

Servitized Business Models

- ➔ Companies should convert not only their value proposition, but also their entire BM, thus moving towards a servitized one, which is an excellent vehicle to enhance competitiveness and foster sustainability simultaneously; (p.4)
- ➔ Tukker proposes three categories of BMs: Product-focused BMs, Usage-focused BMs e Result-focused BMs. (p.5)

Digital technologies

- ➔ Internet of Things
- ➔ Big Data
- ➔ Analytics

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Resultados

ID	Functionality	Digital Technologies		Ref.	Description	CE Value Driver		
		IoT	Big Data & Analytics			Increase Resource Efficiency	Extend Lifespan	Close the Loop
1	Improving product design	X	X	[12,54]	By collecting usage data through IoT and by analyzing them through appropriate analytics, companies may improve the design of their products to better respond to customers' needs.			
2	Attracting target customers	X	X	[12,13,19,22,50,52,54]	An elaboration of the information gathered from the products installed base (through IoT) regarding how customers are using products allows companies to improve marketing activities, with the aim to attract new and targeted customers.			
3	Monitoring and tracking products activity	X		[4,5,12,13,19,22,52,54]	Through IoT, companies monitor product condition, status, location and usage. To enable product sharing between multiple users, this information must be collected and easily made available to each single users.			
4	Providing technical support	X	X	[12,13,52]	Information collected through IoT helps companies and their field network to provide technical support and other services such as spare parts management, repair, etc.			
5	Providing preventive and predictive maintenance	X	X	[12,13,52,54]	The analysis of Big Data collected through IoT by appropriate analytics entails the provision of preventive and predictive maintenance.			
6	Optimizing the product usage	X	X	[12,50,52,54]	By analyzing with appropriate analytics the Big Data collected through IoT, companies may provide to their customers personalized advice with the aim to optimize the usage phase, e.g., how product should be used to reduce energy consumption.			
7	Upgrading the product	X		[52]	When the product offered becomes smart [54], companies may upgrade only its digital elements, e.g., the product firmware, thus enhancing the feasibility of upgrade.			
8	Enhancing renovation and end-of-life activities	X	X	[12,23]	Through the IoT technology, companies can access in real-time product location and condition. This information may be used for a better execution of end-of-life collection, refurbishment, remanufacturing, and recycling activities.			

Resultados

ID	Usage-Focused BMs Functionality	Digital Technologies		Product Life Cycle Stage	CE Value Driver [20]		
		IoT	Big Data & Analytics		Increase Resource Efficiency	Extend Lifespan	Close the Loop
1	Improving product design	X	X X	Begin of life		X	X
2	Attracting target customers	X	X X	Begin of life	X	X	X
3	Monitoring and tracking products activity	X		Middle of life	X	X	
4	Providing technical support	X	X X	Middle of life		X	
5	Providing preventive and predictive maintenance	X	X X	Middle of life		X	
6	Optimizing the product usage	X	X X	Middle of life	X		
7	Upgrading the product	X		End of life	X	X	
8	Enhancing renovation and end-of-life activities	X	X X	End of life			X

Contribuições

Para a academia

- ➔ Destaca a relação entre IoT, Big Data e analytics, o estágio do ciclo de vida do produto, os três geradores de valor da CE e as funcionalidades de BMs focados no uso;
- ➔ Desenvolve um conceptual framework original para operacionalizar as ligações entre as tecnologias digitais e os três drivers de valor de CE;
- ➔ Mostra como as tecnologias digitais ajudam a superar a desvantagem de BMs focados no uso para alcançar CE.

Prática

- ➔ Referência útil para gestores que desejam começar a converter os BMs de suas empresas para servitização e CE;
- ➔ Permite aos gestores alinhar a estratégia da empresa ao caminho desejado, a fim de alcançar a CE no nível micro;
- ➔ Ajuda a projetar um caminho de digitalização do modelo de negócio, escolhendo um conjunto de funcionalidades de BMs.

Minha análise

Pontos fortes

- ➔ Resumo
- ➔ Framework
- ➔ Estudo de caso

Pontos fracos

- ➔ Metodologia da revisão de literatura

Sugestões para melhoria

- ➔ Especificar metodologia da revisão de literatura

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Referência

BRESSANELLI, Gianmarco et al. Exploring how usage-focused business models enable circular economy through digital technologies. *Sustainability*, v. 10, n. 3, p. 639, 2018.