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IDEA MANAGEMENT CANVAS: BIG PICTURE OF WEB-BASED IDEA MANAGEMENT MODELS

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Abstract. Idea management process speeds up the innovation process by providing a systematic and manageable way of generating ideas vital to continues improvement and development within an organisation. There are many web-based tools that can support organisations with their idea management process. Based on the reviewed literature, currently there is no general model in literature that would support organisations in their idea management process based on the context. In this paper, authors describe the different idea management models based on the canvas model to account for the multidimensional context of web-based idea management systems. In prior research, authors have explored and identified the different idea management systems application types based on the different idea management systems classification types developed from the traditional business model canvas model. In this research, authors answer the following questions: What classifications based on the business model canvas could be created for idea management systems application, and how do these types manifest in real life? It is question that is identified a differences in the results, but form practical perspective understanding of different types could help for enterprises to choose the most appropriate one, but for IMS developers to enrich the types of IMS they are creating. In the literature there is only few attempt to classify IMS. Authors use the following research methods: a literature review (data collection: systematic data collection from scientific databases; data analysis: content analysis). Case study comprising data from over 100 enterprises with web-based idea management systems experience (data collection: case studies; data analysis: content analysis). To verify results 10 expert interviews were conducted. As a result, this research unlocks new value for idea management systems users and developers, as it shows the different idea management systems application types based on a specific business model canvas aspect. This resulted in the creation of 9 idea management systems classifications.

Keywords: idea management, idea management systems, canvas, business models, web-based tools.

JEL Classification: M15, O36, O32.

Introduction

Web-based idea management systems (IMS) fall in line with current developments (e.g. growing importance of ICT, the spread of open innovation and co-innovation, etc.) and trends as they are in line with current trends and present organisations with a manageable systematic tool for the generation and evaluation of ideas. The importance of digital systems has further been increased by the COVID-19 pandemic, as it has had an impact on all sectors and made digitisation a necessity.

In the 21st century, idea management (IM) – "can be seen as a subprocess of innovation management with the goals of an effective and efficient idea generation, evaluation and selection" (Brem & Voigt, 2007, p. 306). There are many versions of brainstorming to support creative idea generation (Bonnardel & Didier, 2020). IMS is one tool that helps to manage ideas in a more structured approach. A necessity for a structured approach addresses a key concern highlighted in the innovation literature, that there is a lack of a general model for corporate IM models (Gerlach & Brem, 2017). According to Sandriev and Pratchenko (2014), IMS provides a qualitative increase in the effectiveness of innovative activity in companies (Sandriev & Pratchenko, 2014). That is the reason why this paper aims to describe the different IMS classifications based on the business model canvas, to explore the potential of IMS from 9 different perspectives.

There have been attempts to create a creativity business model (Naggar, 2015) or specific creativity elements for the business model (Brondum et al., 2018). Segers et al.

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(2021) distinguish between ten business model families, but in this paper, the authors will focus primarily on IM business models (See Figure 1).

This research will have both academic and practical contributions by filling the following gaps:

Knowledge gap – no research looks at different IM models through a structured approach like the Business Model Canvas. In previous experience authors of this paper have created the general business model of IM to show the main parity and disparity points for the creation of detailed business model classifications based on 3 elements of the business canvas: key partners, relationships and channels (Segers et al., 2021). This paper is a more extensive research with the following contributions: (1) it explores web-based models; (2) it explores models based on all 9 aspects of IMS. That is the reason this paper describes different IM models based on the canvas model to show the multidimensional context of web-based IMS. The authors have explored that there are different IMS application types based on different IMS classifications developed upon the traditional business model canvas model. Authors use the following research methods in this research: a literature review (data collection: systematic data collection from scientific databases; data analysis: content analysis). Case study comprising data from over 100 enterprises with web-based idea management systems experience (data collection: case studies; data analysis: content analysis).

The following practical knowledge gap is identified – web-based IMS application types in the professional practices are not covered in existing research and there are only a few articles that define the (potential) different application types of IM. For companies, it is important to understand how they can apply web-based IMS and the key aspects they need to consider in their application of a specific IMS and its type.

The following Empirical Gap is identified – there are literature reviews that include descriptions of different IM types but does not summarise these types based on classification. These IM types are mostly looked at from a theoretical perspective with no further focus or elaboration through empirical research.

The following Theory Gap is identified – there is a lack of a general model for corporate IM models (Gerlach & Brem, 2017). According to Sandriev and Pratchenko (2014), IMS provides a qualitative increase in the effectiveness of innovative activities in companies (Sandriev & Pratchenko, 2014). That is the reason this paper aims to describe the different IMS classifications based on the business models canvas, to explore the potential of IMS from 9 different perspectives. Van den Ende et al. (2015) had identified the need to research ouputs of different types of IMS, but in the research field existit the gap- there only few attempts to calassify IMS.

The rest of the paper is structured as follows. The second section introduces the theoretical background. The third section continues by presenting the research method. The fourth section provides the main research findings. This structure can be seen in Figure 2.

Limitations of the research: (1) classification categories are limited to business modela canvas elements; (2) no representation of research on comparative analysis of different methods of idea management in terms of profitability, efficiency, and results to expenses ratio, because these end results are related with innovation management systems that includes implementation part, idea management

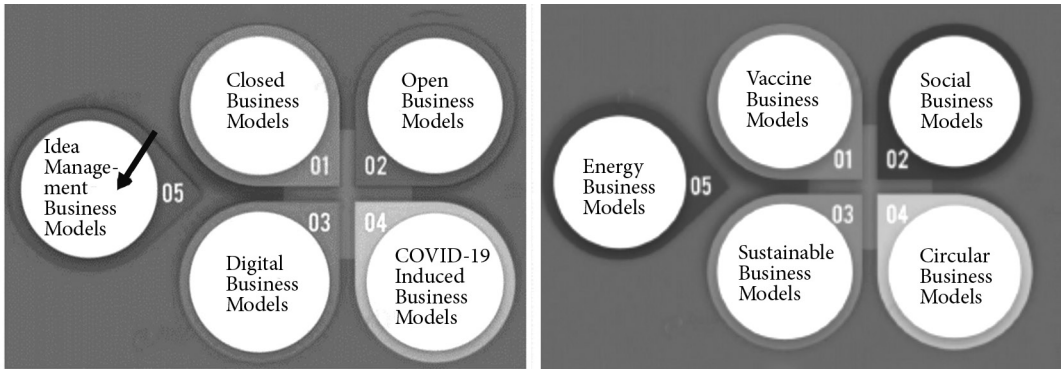

Figure 1. Ten business model families

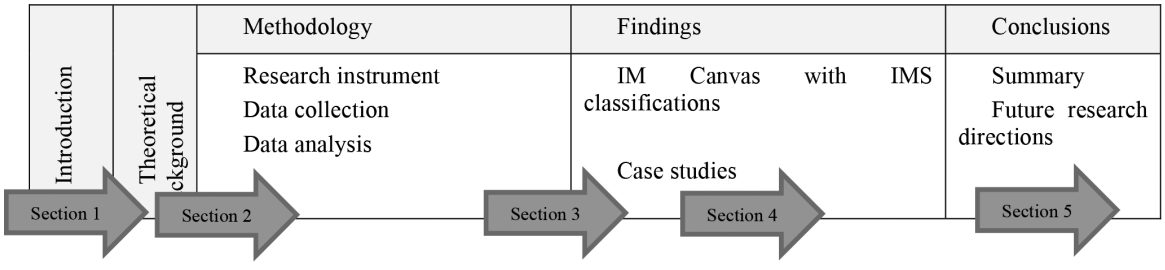

Figure 2. Paper structure

systems are about idea generation and evaluation; (2) only qualitative reseach methods are applied – literature review and case-studies. 1. Theoretically Aspects of Idea Management and Business Model.

To create IMS models based on the business model canvas, it is very important to highlight both concepts: idea management and business models.

1. Business model

The concept of business models is integrated within a variety of academic disciplines (Chesbrough & Rosenbloom, 2002) for example, innovation and strategy (Schwarz & Legner, 2020; Magretta, 2002; Vanhaverbeke & Chesbrough, 2014), business architecture (Gassmann et al., 2014), entrepreneurial analysis (Schaltegger et al., 2016), tooling exploration (Athanasopoulou & De Reuver, 2020) and digitalisation (Witschel et al., 2019).

The three common pillars of a business model are as follows: (1) value proposition; (2) value creation/delivery, and (3) value capture (Segers et al., 2021). In this article, the authors explore the opportunities: (1) value propositions of web-based IMS; (2) value creation/delivery through application of these systems (3) and value capture through IMS.

To conceptualise it, authors apply Business Model Canvas which comprises of 9 parts (Osterwalder, 2010) and they are adapted to fit the IMS contex as follows:

1. Segments – list the top user types of IMS.
2. Value proposition – main values of IMS application.
3. Revenue – who owns the IMS created IPR.
4. Channels – IMS application channels.
5. Relationships – collaboration focuses on IMS.
6. Key activities – what do you do every day to run IMS.
7. Key resources – types of IMS resources.
8. Key partners – list the partners that could be involved in IM.
9. Costs structure – costs of IMS application.

1.1. Idea management

IM consist with existing innovation trends: (1) co-creation (Su et al., 2016); collaborative innovation (Stojčić, 2021); (2) active innovation paradigm (Meissner & Kotsemir, 2016); (3) online user innovation communities (Liao et al., 2021); (4) and open innovations (Carayannis & Meissner, 2017).

In this paper, the definition of the IM is based on the following assumptions that IM is: (1) a systematic process; (2) a manageable process; (3) the main parts of IM are idea generation, evaluation, and repeated idea generation and evaluation (if it is needed). Based on these assumptions, IMS is a tool, tool kit or complex system which provides a systematic, manageable process in IM (Mikelsone et al., 2019). Table 1 provides a detailed description of IMS, characterising all previously mentioned elements with their sub-elements.

Table 1. IMS main characteristics
(source: Mikelsone et al., 2019)

IMS – tool, tool kit or complex system which provides a systematic, manageable process of:		
Idea generation (preparation, capture/ gathering of ideas, retention, enhancement)	Idea evaluation (screening, selection, retention)	Continuation of IM (concept development, distribution of ideas, support during implementation with repeated IM and rewarding, retention)
e.g. Korde and Paulus (2016); Wooten and Ulrich (2015); Summa (2004)	e.g. Westerski (2013); Summa (2004)	e.g. Summa (2004)

The role of IT is increasing, so different web-based tools are becoming more relevant in innovation processes which is the reason the authors focus on web-based IMS.

2. Methodology

Authors of the paper applies qulitative research methods to fill the gap. Applied methods are: systematic literature review and case studies.

2.1. Literature review

A critical, systematic literature review is used to create a theoretical framework for IM Canvas. Data collection is divided into 3 steps: (1) collecting data sets from 5 scientific databases by selecting sources referring to the terms of IM and IMS; (2) selecting sources directly for IM/IMS; (3) excluding duplicates. The literature survey includes sources from the initially available periods of each database until October 2020. The sources selected in stage 3 have been used in systematic literature analysis. A more detailed breakdown of the number of sources of literature by stages is shown in Table 2.

Table 2. Literature review stages

	Stage 1 – in the article title or/and keywords and/or abstract mentioned terms: IM	Stage 2 – directly about (full text available)	Stage 3 – unique sources
Scopus	39 802	26	152
ScienceDirect	364 711	8	
Google Scholar	3 980 000	43	
Sage Journals	152 944	18	
Ebsco	5 129 935	19	
Emerald	107 725	10	
Web of Science	289	62	
Sum:	9 775 406	186	

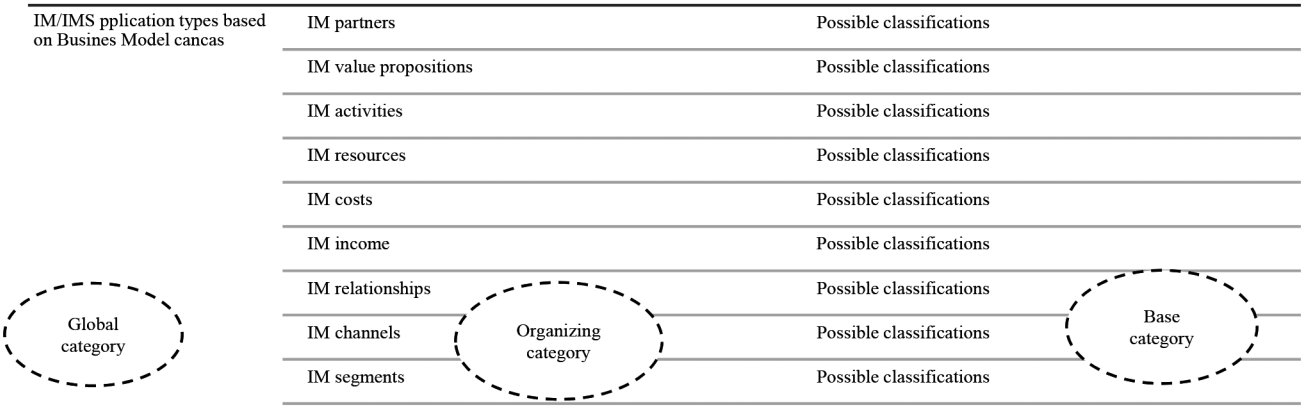

Figure 3. Category network

The process is divided into 3 steps: (1) literature identification (Stage 3 Sources); (2) creating a concept matrix based on the theoretical framework of Business Model Canvas elements; (3) report results. The classification method is based on details for different types of connections that could be classified into various detail categories (Zhao et al., 2005) and in this case the classes are business canvas elements.

Category network for the Second step in Figure 3.

To select the most appropriate data analysis tool authors have compared 10 qualitative data analysis softwares. Data for analysis: CAQDAS Networking Project description of 10 qualitative data analysis softwares. Data analysis: comparitive analysis.

Main parities of these systems based on the analysis:

Format:

T1. Wide range of data – from text to multimedia (audio/video, graphic, data, simple text files, rtf. data files, Google Earth files, data from web-pages, tables from different files).

T2. Wide variety of data export formats – Excel, Word, PDF, SPSS, HTML, XTML.

Usage options

T3. Software might have multiple use cases – individual or group.

T4. Most types of software must be installed, but some some are web based

General benefits

T5. CAQDAS are simple effective, intuitive and flexible tools.

Table 3. Comparison of qualitative data analysis sofwares

Name	Data type T-text, M-multi-media	Exporting	Individual use (1)/Group use (2)	Installation (1)/ web-application (2)	Coding hierarchical (1), nonhierarchical (2)	+
ATLAS.ti	T/M	.RTF, SPSS, .html, .xml	1/2 (data sharing)	1	1/2	Category mapping
Deddose	T/M	Excel, .pdf, Word	1/2	2	1	Diverse method applications
CRS	T/M	Data bases, text documents	1	1	1/2	For free
Hyper Research	T/M	Text documents, Excel files	1	1	1/2	Hypothesis testing
MAXQDA	T/M	.RTF, .html, Excel	1/2 (data sharing)	1	1/2	Visualizations, focus group data
Mixed Media Grid	T/M	–	2	1	limited	Open code
Nvivo	T/M	.RTF, .docx, .pdf, .xls, .html, .xml	1/2	1	1/2	Many visualisation options, category mapping
QDA Miner	T	Excel, .html, .bmp, .wmf, .png, .jpg	1/2	1	1/2	Option to seek the same meaning words
Quirkos	T	.RTF, .docx	1/2	1	1/2	Data code comparison
Transana	M	Text documents, graphic files	1/2	1	2	For teams

Marketing system

T6. Both hierarchical and non-hierarchical coding systems within CAQDAS.

Writing tools

T7. A crucial tool for CAQDAS that allows not only to create codes but to add important comments and notes.

Visualisation tool

T8. Multiple visualisation tools – canvas view, cluster analysis tool diagram, configuration table, mapping, network maps, citation matrix, word clouds and trees.

Extra tools

T9. Software differiates by the extra tools – analysis tools, transcript options etc.

Additional not only parities but also disparities were analysed. See in Table 3.

Based on all critearia Atlas.ti system was choses for data analysis of literature for content analysis according to pre-defined criteria of business model canvas.

2.2. Case studies

IMS evaluation was conducted to verify criteria found in the literature and improved with data-based classification criteria. To analyse the IMS, the case analysis, the results of which have been processed through content analysis (see Table 4).

Table 4. Case study steps

Data gathering method	Data analysis method	Time Period	Method application steps
Case studies	Content analysis	2010–2020	1. Case study document analysis, based on 100 IMS webpages, found case study descriptions. 2. Content analysis of materials. 3. Case study description, development, and evaluation.

Case study analysis steps:

Step 1 – Analysis of 100 case analysis documents based on full and complementary information and individual communication available on IMS websites, to get additional information on the use of specific IMS and its results.

Step 2 – Contented analysis of the materials got. This step fills in and analyses information in case analysis protocols. A protocol is designed as a category map that makes it easy to analyse. The category map elements are the same as in the literature review and overall IMS application elements (see Table 5).

Step 3 – Creating and comparing case descriptions.

2.3. Expert interviews

Authors have conducted 10 expert interviews with IM and design thinking experts to verify the results. All interview data was anonymized. Expert criteria: (1) person with over 3-year practical experience in IM as a professional that provides these services to enterprises or is the responsible person about it in the enterprise; (2) highest education in related fields. In Table 6, see the information about informants. Interviews were conducted in a one-on-one and Zoom settings. The interviews took place Q3 in 2022. The interviews ranged from 30 min to 60 min long.

Table 5. Category map for case studies

Idea Management	Idea Management Direct Results
– Web-based IMS – urpose of use	Quantity of ideas Quality of ideas (how advanced solutions are) Engagement (how many people are involved)
Organisation system	Other structural sources – task
– Product user – Size of the organisation (large/medium/small according to the EU principles) – Country (product user) – Pre-use experience (yes/no, if so, how long) – IM moderation (automatic, manual, both) – Ownership of ideas (company, ideas, shared) – Local or international use – Number of people involved/size of the network	– Task – Time period – Method of using the IM system (internal ideas management, external ideas management, mixed ideas management) – Parties involved in IM – Active (focused)/liability (unfocused) – Product/process/organisational/marketing/all ideas created – Adaptability (whether a task is tailored to different IM members, one evaluates, while another group creates ideas) – Award for the best ideas (yes/no)
Usage types – how the system has been accepted/used	Final results
Whether the mode of use is consistent with the type of IM (consistent/inconsistent)	– Achieving an eligible target (yes/no) – In this case, those end-gains
Application-based on the created classifications	Classifications based on the IM application (based on 9 elements of the business model canvas)

Table 6. Experts for the interviews
(source: created by the authors)

Identifier	Sector	Position	Experience (years)	Education
INT1	Academical, private	Innovation consultant	10	Business administration
INT2	Private	Innovation Lead	4	Economics
INT3	Academical, private	Innovation consultant	5	Business administration
INT4	Public, academical	Innovation consultant	6	Economics

End of Table 6

Identifier	Sector	Position	Experience (years)	Education
INT5	Private	Innovation Lead	4	Business administration
INT6	Academical, private	Innovation consultant	7	Business administration
INT7	Private, public	Innovation Lead	8	Economics
INT8	Private	Innovation consultant	9	Business administration
INT9	Private	Innovation Lead	15	Business administration
INT10	Academical, private	Innovation consultant	11	Business administration/ Economics

Main question fields are represented in the Table 7. According to these questions, data analysis was made – it was used as the code map.

Table 7. Interview maps (source: created by the authors)

Main question field by IMS type	Support for the Classification Application Practically
13 Classification categories	Positive (+); Neutral (0); Negative (–)

3. Results

Based on the literature review, authors have created classifications of IMS according to all parts of the Business Model Canvas. See the IM Canvas in Table 8.

In the next subchapters, the authors of this paper describe these classifications. In previous studies only classifications based on key partners, relationships and channels were analyses and proposed, but in this paper authors try to find classifications based on all business model canvas elements. Classifications ar wery iportant, because:

3.1. Idea management models based on key partners

Based on potentially involved IM sources, business models may be classified as internal, external and mixed:

1. External IM – external idea source involvement in idea generation and evaluation (involved sources – experts, crowds, clients, partners, NGOs, universities, etc.) (e.g. Bothos et al., 2008; Westerski & Iglesias, 2012).
2. Internal IM – internal brainstorming and evaluation (involved sources – employees), enable organisations to generate pools of ideas from a large number of employees (Klein & Lechner, 2010; Shani & Divyapriya, 2011; Bettoni et al., 2010).
3. Mixed IM – internal and external sources of IM are included in the generation and evaluation of ideas (Fritz, 2002; Voigt & Brem, 2006; Brem & Voigt, 2007; Sandstrom & Bjork, 2010).

3.2. Idea management models based on key activities

Key activities in IMS are idea generation (preparation, capture/gathering of ideas, retention, enhancement); idea evaluation (screening, selection, retention); further IM (further concept development with IM iterations, distribution of ideas, retention). Based on the provided IM functions: (1) limited; (2) full; (3) extra (Mikelsone et al., 2019). See Table 9.

Table 8. Idea management model (source: created by the authors)

C1 Key Partners	C2 Key Activities	C3 Value Propositions	C4 Relationships	C5 Segments
Idea generators and/ or evaluators: Employees, partners, NGOs, researchers, crowds, suppliers, etc. Motivations for partnerships: acquisition of knowledge CLASSIFICATION: Based on the sources involved in IM, INTERNAL EXTERNAL MIXED	Basic activities: idea generation and evaluation; Circulation: ideas C2.1. CLASSIFICATIONS: Based on the provided IM functions: LIMITED FULL EXTRA C2.1. CLASSIFICATIONS: Based on the moderation type of IM: AUTOMATED MANUAL AUTOMATED/ MANUAL	Basic Values: IM, innovation management, cooperation, overall management improvements. C.3.1. CLASSIFICATION: Based on the expected value: IM/INNOVATION MANAGEMENT IMPROVEMENTS DECISION-MAKING IMPROVEMENTS COLLABORATION IMPROVEMENTS C.3.2.CLASSIFICATION: Based on the expected ideas: PRODUCT PROCESS MARKETING ORGANISATIONAL	Innovation networks IM system members are involved in the processes as the organisation decides *CLASSIFICATION: Based on the focus of IM,* ACTIVE PASSIVE	Entrepreneurs Innovators Researchers C5.1. CLASSIFICATION: Based on the application model: SPECIAL TASK USER EVERYDAY USER C5.2. CLASSIFICATION: Based on the geographical areas: LOCAL INTERNATIONAL

End of Table 8

<table>
<tr><td>C1 Key Partners</td><td>C2 Key Activities</td><td>C3 Value Propositions</td><td>C4 Relationships</td><td>C5 Segments</td></tr>
<tr><td rowspan="2"></td><td>C6 Key Resources</td><td rowspan="2">C7 Channels
Entrepreneurs publish the opportunity to share ideas and/or evaluate ideas in their internal or external networks
CLASSIFICATION:
Based on the technological level involved in IM,
REAL-LIFE
WEB-BASED
AI</td><td>C7 Channels</td><td rowspan="2"></td></tr>
<tr><td>Human: innovation communities; community steering teams
Physical: collaboration platforms
Intellectual: IM tools and techniques
Financial: for the IM process organisation

CLASSIFICATION:
Based on the tool provided:
COMMERCIAL
SEL-DEVELOPED</td><td>Entrepreneurs publish the opportunity to share ideas and/or evaluate ideas in their internal or external networks
CLASSIFICATION:
Based on the technological level involved in IM,
REAL-LIFE
WEB-BASED
AI</td></tr>
<tr><td colspan="3">C8 Cost Structure (Classification)</td><td colspan="2">C9 Revenue Streams (Classification)</td></tr>
<tr><td colspan="3">Definition: Costs related to the IM process, i.e. the cost of IMS)

C8.1. Based on the price:
USAGE FEE
IDEA FEE
INVOLVEMENT FEE
LIST PRICE
BROKERAGE FEE
C8.2. Based on the reward type for idea creators:
FINANCIAL REWARDS
NON-FINACIAL REWARDS</td><td colspan="2">Definition: For entrepreneurs: the value of implemented ideas, patent commercialisation, etc.

Based on the Intellectual Property Rights (IPR):
IPR FOR CREATORS
IPR FOR ORGANISATION
MIXED IPR (SHARED BETWEEN CREATORS AND ORGANISATIONS)</td></tr>
<tr><td colspan="3">(source: based on the literature research results)</td><td colspan="2">(source: based on Segers et al., 2021)</td></tr>
</table>

Table 9. Idea management models based on key activities

Limited IMS		Full IMS		Extra IMS	
Description: Supports only several IM functions	*Main supported functions:* Idea generation	*Description:* Supports all IM functions	*Main supported functions:* Idea generation, evaluation, further IM	*Description:* Supports all IM functions plus the implementation process of ideas	*Main supported functions:* Idea generation, evaluation, further IM plus innovation management functions of idea implementation

Based on the functions provided in process IM, all systems can be classified as limited IMS, full IMS, extra IMS. Systems providing only ideas generation (limited IMS) or systems providing not only the functions of the IMS process but also some innovation management functions, such as implementing ideas (extra IMS), are also classified as IMS.

A crucial element in the IM organisation system is the moderation of IMS – major moderator actions: (1) organising the search for new ideas; (2) stimulating the creation of new ideas; (3) establishing a process for evaluating ideas and (4) engaging in developing and supporting valuable ideas put forward for further implementation (Beretta, 2015). Based on the moderation type of IMS application could be described as automated – it means that all processes could happen automatically, manually – all processes should be done by the moderator, mixed version – provides opportunities for both application types.

3.3. Idea management models based on key resources

IMS user organisations should have several resources to apply IMS:

1. Human: innovation communities; community steering teams.
2. Physical: collaboration platforms.
3. Intellectual: IM tools and techniques.
4. Financial: for IM process organisation.

The main resource in this area is a web-based IMS platform and there could be 2 types: commercially available or self-developed/adapted IMS.

3.4. Idea management models based on value proposition

The value proposition of IMS for innovators and ideators: is the availability of knowledge and skills, never-ending stimulation of ideas generated by others but for researchers: support for their research, supply of knowledge. For entrepreneurs: 199 possible values, see in Figure 4.

Based on the expected value, all systems could be divided as:

1. IM/innovation management improvement IMS.
2. decision improving IMS.
3. collaboration improvement IMS.

IMS is connected also with innovation results. That is the reason authors have added classification based on the expected ideas: product, process, marketing, and organisational.

These types are based on the latest approach in the Oslo Manual, which are distinguished – innovation as an outcome (an innovation) and the activities by which innovations come about (innovation activities) (OECD, 2018). In this case, innovation activity is the application of IMS, but the results are innovative ideas: product, process, marketing or organisation (applied old classification of innovations in Oslo Manual).

3.5. Idea management models based on channels

Zhu et al. (2021) study the promotion and importance of idea diffusion through multiple channels, which is the reason the author of this paper has discussed 3 different channels based on Segers et al. (2021):

1. Real-life IM model – IM is in real-life sessions that could be moderated by organisation members or consultants.
2. Web-based IM model – web-based tool application for IM- human-driven IM.
3. AI IM model – a web-based tool that provides IM but is AI-driven. Mainly these ideas are data-driven ideas or based on the combination of existing solutions.

3.6. Idea management models based on relationships

Based on IM focus, IMS could be classified as active and passive ones. This classification reveals that there is an IM that passively gathers ideas that are not concentrated on a specific purpose, while the active IM provides functions to gather ideas for specific purposes (Gamlin et al., 2007). Passive IM provides the potential for more passive relationships by just collecting all the ideas. There could be an internal or external suggestion box where employees submit all the ideas that they have, related to a process, a product, an organisational and a marketing issue. An active IM provides the potential for more active relationships by just collecting specific types of ideas through idea contests and tasks. Active IMS provides an opportunity to manage relationships with idea creators in a more detailed way than it used to be.

3.7. Idea management models based on segments

IMS could be applied by entrepreneurs, innovators, and researchers. Those could be with or without experience in IM (Mikelsone et al., 2019). All sector representatives could use IMS: academic, private and public organisations and their members.

Based on the application mode, IMS users could be divided as:

1. special task user – that applies IMS only for specific tasks.
2. everyday user – that applies IMS all the time without time breaks.

Based on the geographical areas, all IMS application cases (Mikelsone et al., 2020): are local or international.

3.8. Idea management models based on costs

Related to IM process, i.e. the cost of IMS (different costs – usage fee, subscription fees, lending/renting/leasing, licensing, brokerage fees, list price, product feature dependent, customer segment dependent, volume dependent), rewards for idea generators, etc.

Classification based on the price:

1. Usage fee (time-based fee).
2. Idea fee (fee about the number of ideas created).
3. Involvement fee (fee about the number of participants).
4. List price (onetime payment).
5. Brokerage fee.
6. Classification based on the reward type for idea creators:
   - Financial rewards.
   - Non-financial rewards.

3.9. Idea management models based on income

Main incomes from IMS – the value of implemented ideas, patent commercialisation, etc. Based on the IPR right:

1. IPR for idea creators.
2. IPR for the organisation.
3. Mixed IPR for idea creators and organisations.

4. Classification verification with case studies and expert interviews

This section describes the results of the analysis of 100 cases of IMS use. Many companies in the world are also looking at the experience of IMS, for example, Volkswagen, Lidl, Cisco, Microsoft, Nestle, Procter and Gamble, Henkel, Roche, Fujitsu, Boeing, Xerox, Panasonic, Virgin trains.

In further paragraphs, the authors will describe 3 of 100 cases – to show how created classifications are materialised through these cases.

Developing ideas for a variety of improvements in the company's activities over 2 years through IMS Sideway6 was the task of British Airways, involving 10000 employees and clients, of which 3300 were actively involved and

(1)Delivery (on time)	(69)Productivity through worker satisfaction	(135)Culture
(2)Ability to cope with users and non-users expectations and needs	(70)Profit generated and profitability (growth)	(136)Decision making
(3)Accuracy of customer orders	(71)Profit margin	(137)Differentiation
(4)Appropriateness	(72)Program effectiveness (capacity and outcomes)	(138)Disciplinary actions
(5)Aspects of identity	(73)Project design, implementation, evaluation	(139)Discretion
(6)Autonomy	(74)Prosecution	(140)Efficiency
(7)Beliefs	(75)Provide information for decision making	(141)Efficient information processing
(8)Biased for action	(76)Quality and it's improvements	(142)Employee self-esteem
(9)Bringing the planned strategic actions to a good end	(77)Quality of life	(143)Employee well being
(10)Broadening of the market base	(78)Reliability	(144)Employee-perceived adaptability
(11)Business results	(79)Repeat business / loyalty	(145)Equity
(12)Leveraging of resources	(80)Reputation	(146)Expenses
(13)Cash flow	(81)Responsiveness	(147)Feedback
(14)Cash out	(82)Retention employee	(148)Financial performance
(15)Citizen orientation	(83)Return of investments	(149)Flexibility
(16)Civil participation	(84)Revenues	(150)Funding
(17)Close to costumers	(85)Right decisions in right times for right reasons	(151)Governance
(18)Cohesion	(86)Sales Achieved (growth)	(152)Grievances
(19)Commitment and involvement	(87)Sales per advertising dollar	(153)Growth
(20)Commitment towards learning and development	(88)Satisfaction of supplier with organization	(154)Increase of expertise and employee development
(21)Community satisfaction with organization	(89)Satisfaction through attention to needs	(155)Increased employee versatility/flexibility
(22)Competition	(90)Satisfying clients (human relations)	(156)Increasing resourcefulness (open system)
(23)Community improvement	(91)Scrap material per unit	(157)Individual employee performance/ efficiency
(24)Cooperation	(92)Selectivity	(158)Networks and partnerships
(25)Cost minimization	(93)Social responsibility	(159)Information m anagement – communication
(26)Cost of capital	(94)Socialite transformation	(160)Initiation of ideas and practices
(27)Cost of goods sold	(95)Staff attitude	(161)Innovativeness/ innovation/ innovation capabilities
(28)Cost of raw materials	(96)Staff complains	(162)Integration or it's errors
(29)Customer complains	(97)Stakeholder involvement	(163)Internal efficiency
(30)Customer satisfaction	(98)Stock return	(164)Internal equilibrium
(31)Demand	(99)Sub-units performance	(165)Interpersonal relationships
(32)Deployment of predefined strategy	(100)Supervisor support	(166)Inventory cost
(33)Determine reward distribution	(101)Supplier welfare	(167)Job satisfaction
(34)Employee turnover rate	(102)Supply	(168)Keeping the vision and mission up to date
(35)Employees levels of ambiguity regarding customers	(103)Task orientation	(169)Leanness
(36)Enforcing changes to our society	(104)Teamwork	(170)Long-term sustainability
(37)Environmental control	(105)Technical efficiency	(171)Management effectiveness (capacity and outcomes)
(38)Environmental impact	(106)Technical excellence	(172)Manager-perceived adaptability
(39)Equipment supply	(107)Timely implementation of change	(173)Motivation
(40)Evaluate the effects of change	(108)Transformative leadership	(174)Open communication
(41)External focus	(109)Turn away eligible clients	(175)Openness
(42)External reporting purposes	(110)Turnover	(176)Optimal use of available resources
(43)Extra role behavior	(111)Turnover rate attraction of talent	(177)Order
(44)Food and labor cost percentages	(112)Units produced	(178)Organisational commitment
(45)Image building	(113)Unity of command and direction	(179)Organisational management
(46)Immediate superior	(114)Vehicle hour	(180)Organizational attachment
(47)Improving internal processes	(115)Viability	(181)Organizational climate
(48)Increased ability to res pond to change/ pressure / environment	(116)Ability to accomplish core mission	(182)Organizational structure and governance
(49)Independence of board	(117)Ability to identify problems or opportunities	(183)Overall performance
(50)Industrial action	(118)Absenteeism	(184)Overall satisfaction
(51)Investor attraction	(119)Accessibility via various channels	(185)Performance management
(52)Labor cost	(120)Adaptability	(186)Personal effectiveness
(53)Leadership contingency fit	(121)Advantages	(187)Physical comfort
(54)Leadership for quality	(122)Average assets	(188)Planning (also strategic) and goal setting
(55)Leadership management	(123)Clarity	(189)Productivity
(56)Legitimization	(124)Clear authority and discipline	(190)Self-control
(57)Management of scarce resources	(125)Communication	(191)Structure/strategy congruence
(58)Market share	(126)Compensation	(192)Values
(59)Need for independence	(127)Competitive attainment	(193)Willingness to recommend
(60)New market development	(128)Competency	(194)Work pressure
(61)New product development	(129)Congruence of internal processes	(195)Workforce morale
(62)Operating efficiency ratio	(130)Consensus	(196)Working conditions
(63)Operating expense/employee	(131)Control	(197)Achieving goals
(64)Operating expense/revenue	(132)Controllable expenses	(198)Stability
(65)Organizational environment fit	(133)Core functions	(199)Survival
(66)Product maximization	(134)Creating efficient output from limited means available	
(67)Product price leadership		
(68)Productivity through people		

Figure 4. Idea management values

created 2700 ideas. That was integrated into a permanent operation, replacing focus groups. It was concluded that the quantity and quality of ideas have increased, the involvement of employees and customers has increased and that feedback is improved. See details in Table 10.

Siemens implemented IMS Spigit to address internal and external business challenges. For example, the Mobility IDEA Contest helped to get ideas about facing traffic problems. The winner of the contest "proposed using quadcopters to find open parking spots, determine the shortest path to that spot, and help guide drivers to the designated space via a mobile app or through a car's communication system (Planview, 2019)". See more in Table 11.

Nielsen approached Brightidea and, over the course of 2012, Nielsen moved their model to a dedicated innovation group. These groups manage innovation initiatives across all organisational units. Now, the company runs 10–15 innovation initiative tasks all year in specifically identified categories across all business units. These initiatives are centred on a topic and objective and can be run in short-term sprints or run all year long. As KPI for IMS success- "Cycle Time" and is centred on saving time, for example, in 2013, Nielsen was able to save 4,000,000 hours documented across all teams (Brightidea, 2017). Additional KPI is new product development. See detailed Case protocol in Table 12.

100 case study analysis results proved that all types of IMS applications could be found in Case Studies. It should be noted that in some classifications simultaneously organisation could use several IM types:

1. Based on the sources involved in IM (Canvas element – Partners): the internal application was more than in half of the cases (52 cases); external (30 cases); mixed (18 cases).

Table 10. Case study: British airways (source: Sideway6, 2017)

IM	Web-based IMS	Sideway6
	Purpose of use	Get ideas from employees and customers
Organisation system	Product user	British Airways
	Size of the organisation (large/medium/small according to the EU principles)	Large
	Country (product user)	United Kingdom
	Pre-use experience (yes/no, if so, how long)	Yes
	IM moderation (automatic, manual, both)	Both
	Ownership of ideas (company, ideas, shared)	For the company
	Local or international use	International
	Number of people involved/size of the network	10 000
Other structural sources – task	Task	Create ideas for improvements
	Time period	2 years
	Method of using the IMS (internal ideas management, external ideas management, mixed ideas management)	Mystified
	Parties involved in IM	Employees and customers
	Active (focused)/Liability (unfocused)	Focused
	Product/process/organisational/marketing/all ideas created	All
	Adaptability (whether a task is tailored to different IM members, one evaluates, while another group creates ideas)	It is
	Award for the Best Ideas (yes/no)	It is
IM direct results	Quantity of ideas	2700
	Quality of ideas (how advanced solutions are)	–
	Engagement (how many people are involved)	3300
Usage types – how the system has been accepted/used	Whether the mode of use is consistent with the type of IM (consistent/inconsistent)	Consistent
Final results	Achieving an eligible target (yes/no)	It is
	In this case, those end-gains	Increasing the quantity and quality of ideas Improved feedback Increased engagement
Classification	Internal; full; automated/manual; IM/innovation management improvements product process; marketing; organisational; active; everyday user; local; commercial; web-based; based on the costs: ni; IPR for company.	

Table 11. Case study: Siemens (source: Planview, 2019)

IM	Web-based IMS	Spigit
	Purpose of use	Developing IM and innovation management process
Organisation system	Product user	Siemens
	Size of the organisation (large/medium/small according to the EU principles)	Large
	Country (product user)	Germany
	Pre-use experience (yes/no, if so, how long)	Yes
	IM moderation (automatic, manual, both)	Both
	Ownership of ideas (company, ideas, shared)	For the company
	Local or international use	International
	Number of people involved/size of the network	–
Other structural sources – task	Task	Highway lighting is more environmentally friendly
	Time period	3 months
	Method of using the IMS (internal ideas management, external ideas management, mixed ideas management)	External
	Parties involved in IM	Primary – University students
	Active (focused)/Liability (unfocused)	Active
	Product/process/organisational/marketing/all ideas created	Product, Process, Organizations
	Adaptability (whether a task is tailored to different IM members, one evaluates, while another group creates ideas)	Users submit, comment and rate the best ideas. Top-rated Siemens and recruited.
	Award for the Best Ideas (yes/no)	Yes
IM direct results	Quantity of ideas	190
	Quality of ideas (how advanced solutions are)	–
	Engagement (how many people are involved)	–
Usage types – how the system has been accepted/used	Whether the mode of use is consistent with the type of IM (consistent/inconsistent)	Consistent
Final results	Achieving an eligible target (yes/no)	It is
	In this case, those end-gains	Marketing, Best Students Accepted
Classifications	External; full; automated/manual; IM/innovation management improvements product process; organisational; active; special task user; international; commercial; web-based; pricing: ni; financial rewards; IPR for organisation.	

Table 12. Case study: Nielsen (source: Brightidea, 2017)

IM	Web-based IMS	Brightidea
	Purpose of use	To improve the management of ideas
Organisation system	Product user	Nielsen
	Size of the organisation (large/medium/small according to the EU principles)	Big
	Country (product user)	USA
	Pre-use experience (yes/no, if so, how long)	No
	IM moderation (automatic, manual, both)	Both
	Ownership of ideas (company, ideas, shared)	For the company
	Local or international use	International
	Number of people involved/size of the network	36000

End of Table 12

IM	Web-based IMS	Brightidea
	Purpose of use	To improve the management of ideas
Other structural sources – task	Task	10–15 contests each year
	Time period	Since 2012
	Method of using the IMS (internal ideas management, external ideas management, mixed ideas management)	Internal
	Parties involved in IM	Employees
	Active (focused)/Liability (unfocused)	Active
	Product/process/organisational/marketing/all ideas created	All
	Adaptability (whether a task is tailored to different IM members, one evaluates, while another group creates ideas)	Employees consign and value their ideas. They are then taken over by the innovation group.
	Award for the Best Ideas (yes/no)	No
IM direct results	Quantity of ideas	500 ideas per quarter
	Quality of ideas (how advanced solutions are)	–
	Engagement (how many people are involved)	–
Usage types – how the system has been accepted/used	Whether the mode of use is consistent with the type of IM (consistent/inconsistent)	Consistent
Final results	Achieving an eligible target (yes/no)	Yes
	In this case, those end-gains	4,000,000 hours documented across all teams
Classification	Internal; full; automated/manual; IM/innovation management improvements product; process; marketing; organisational; active; special task user; international; commercial; web-based; based on the costs and income: ni; IPR for company.	

2. Based on the provided IM functions (Canvas element – Activities): limited (2); fill (82); extra (16).
3. Based on the moderation type of IM (Canvas element – Activities): automated (12); manual; (10); automated/manual (78).
4. Based on the expected value (Canvas element – Value proposition): IM/innovation management improvements (82); decision-making improvements (34); collaboration improvements (21).
5. Based on the expected ideas (Canvas element – Value proposition): product (79); process (29); marketing (17); organisational (20).
6. Based on the focus of IM (Canvas element – Relationships): active (89); passive (11).
7. Based on the application mode (Canvas element – Segment): special task user (52); everyday user (48).
8. Based on the geographical areas (Canvas element – Segment): local (72); international (28).
9. Based on the tool provided (Canvas element – Resources): commercial (92); self-developed (8).
10. Based on the technological level involved in IM (Canvas element – Channels): real life (2); web-based (100); AI (1).
11. Based on the pricing method (Canvas element – Costs): usage fee (30); idea fee (20); involvement fee (21); list price (19); brokerage fee (1), no information about 9 cases.
12. Based on the reward type for idea creators (Canvas element – Costs): financial rewards (37); non-financial rewards (72), no information about 19 cases.
13. Based on the IPR: IPR for creators (8); IPR for the organisation (90); mixed IPR (2).

It shows the tendencies of IMS applications in organisations.

Based on the expert intervies authors have concluded that all created classification categories could be applicapble in practice (see Table 13).

Strong support for classification C1 – Based on the sources involved in IM (Canvas element – Partners): internal; external; mixed. Based on the provided IM functions (Canvas element – Activities): limited; full; extra. Experts agreed to this classification, higliting that extra IMS are sometimes also innovation management systems. Based on the moderation type of IM (Canvas element – Activities): automated; manual; automated/manual. Experts commented that there could be included also AI funcionalities of IM as separate type. It could be great research point for the future.

Based on the expected value (Canvas element – Value proposition): IM/innovation management improvements;

Table 13. Interview maps (source: created by the authors)

INT	**Support for the Classification Application Practically** Positive (+); Neutral (0); Negative (–)												
	C1	C.2.1	C2.2	C.3.1	C.3.2.	C4	C5.1.	C5.2.	C6	C7	C8.1	C8.2	C9
INT1	+	+	+	+	+	+	+	+	+	+	+	+	+
INT2	+	0	0	0	0	+	0	0	0	+	+	0	+
INT3	+	+–	+–	+–	+–	+	+–	+–	+–	+	+	+–	+
INT4	+	0	0	+	0	+	+	+	+	+	+	0	+
INT5	+	+	+	+	+	+	+	+	+	+	+	+	+
INT6	+	+	+	0	+	0	0	0	0	+	+	+	+
INT7	+	+	+	+	+	+	+	+	+	+	+	+	+
INT8	+	+	+	+	+	+	+	+	+	+	+	0	+
INT9	+	+	+	+	+	+	+	+	+	+	+	+	+
INT10	+	+	+	+	+	0	+	+	+	+	+	+	+

decision-making improvements; collaboration improvements – these types were supported, but with advice to clarify sub-groups of all these elements. Based on the expected ideas (Canvas element – Value proposition): product; process; marketing; organizational – this classification was supportend by majority of experts, but with extra note to add class- non-defined ideas for development.

Based on the focus of IM (Canvas element – Relationships): active; passive – this classification was supported, but with comment that mixed approach also could be existing – active-passive.

Based on the application mode (Canvas element – Segment): special task user; everyday user – both were supported – but it was higlited that it should be specified are the user companies or individuals involved in IM. In classification it it focused only on company level not individuals. Based on the geographical areas (Canvas element – Segment): local; international – was supported by majority, with comment about possible glocal version.

Based on the tool provided (Canvas element – Resources): commercial; self-developed – majority supported this classification. Extra comment that also additional type could be adapted IMS.

Based on the technological level involved in IM (Canvas element – Channels): real-life; web-based; AI – all experts supported this divison. Based on the pricing method (Canvas element – Costs): usage fee; idea fee; involvement fee; list price; brokerage fee – these classes were supported, but based on the reward type for idea creators (Canvas element – Costs): financial rewards; non-financial rewards- again mixed approach was suggested as extra class.

Based on the IPR: IPR for creators; IPR for organisation; mixed – this classification was supported.

5. Discussion

In this article, the authors investigate the status quo IM models – reveal different IMS application types based on the specific business model canvas aspects – 9 classifications of IMS are created.

However, in this investigation were some limitations: (1) analysed literature sources amount based on the research design (selected databases, time frame and selection approach); (2) only 100 case studies are included to verify results; (3) classifications based on key partners, channels and relations are used pre-defined from previous studies and not discussed; (4) separate IM models based on Business Model Canvas elements are proposed.

According to the first limitation, the search is restricted to the publications in only some databases: the collection of the database may limit authors to identifying other possible IM models. The limitation is related also to the publication times, on the one hand from existing research and on the other hand from this study: during the time a paper is published, other researches are made and newer knowledge is obtained. Limitation states that, according to some scientists, the search with used keywords can be seen as restricted because of the complexity of the topic. Further deepening of particular elements would be suggested.

The second limitation about 100 web-based IM cases provides information only about web-based cases, but not about real-life or AI – which limits the verification results. But AI and real-life sessions could be researched with proposed IM models in the future.

The third limitation about pre-defined classifications that were considered in previous studies should be discussed in detail.

Fourth limitation – separate IM models based on Business Model Canvas elements are proposed, but there could be created composite types of IM models to seek the best IM Canvas elements combinations that lead to success.

A key practical implication is related to the possibility of applying created classifications in practice to use full IM potential. The approach may help organisations and enterprise innovators who desire to create a more systematic IM. The IM may provide far more quality and playfulness to the complex, innovative – other scholars confirm that besides the quality and game dynamics, the IM may enhance the efficiency of the ideation process (Hesmer et al.,

2011).

An additional question is how often these models are applied in real-life sessions because in this case, it was applied, verified by 100 web-based IM cases only. The results of these cases with all web-based IM models were very good, but there are a lot of discussions that technologies destroy creativity (Hoffmann et al., 2016; Todd, 2003), but maybe in a systematic and well-managed IM process, creativity could be boosted, as it may facilitate more open discussion and co-working environment.

Based on the sources involved in IM (Canvas element – Partners): internal; external; mixed. This classification resonates with open innovations (external and mixed) and closed innovations (internal) approaches. For example, one common external IM sub-type is crowdsourcing (Temiz, 2021). In future studies, these sub-types should be researched in detail.

Based on the tool provided (Canvas element – Resources): commercial or self-developed- in future studies also adaptation of existing IMS should be researched (Eloranta, 2013).

Classification based on the provided IM functions (Canvas element – Activities): limited, full and extra provides only descriptions of the functions included, but not the application perspectives of these functions in different innovation stages. It would be topical in future research to explore it because it could be a philosophical implication since mostly it is related to the first stages of the innovations (Herrmann et al., 2020; Gerlach & Brem, 2017).

Based on the moderation type of IM (Canvas element – Activities): automated; manual; automated/manual. These are only activities defined based on moderation, but there are many other activities related to IM, for example, task management (Mikelsone et al., 2022).

Based on the expected value (Canvas element – Value proposition): IM/innovation management improvements; decision-making improvements; collaboration improvements.

Based on the reward type of idea creators (Canvas element – Costs): financial rewards; non-financial rewards. In future studies, detailed rewards should be overlooked. Since Rewards in IM are more important for idea creator motivation than anything else (Boeddrich, 2004; Charles & Chucks, 2012; Lasrado et al., 2015) and there are different rewards, for example, monetary benefits, a salary, a bonus or commission, joy, meaningfulness, recognition, reputation, etc.

Conclusions

Theoretical and practical implications

This paper offers several theoretical implications for scholars and researchers. First, the business models and value creation have been used in a variety of research contexts, but it has not been extensively applied to the field of IM. This study provides a useful framework for the IM application within the business model and detailed characterisation of the practical construct. The study creates a theoretical and practical framework. It expands the domain of the IM by characterising it through a business model canvas – resulting in creating an IM canvas.

Second, the results provide some insights that may help in designing future studies. They highlight the importance of empirical and theoretical research to select elements to include in such frameworks. It also shows that there are a lot of possible elements to research in the future in all canvas contexts.

Thirds, this paper's authors tried to explore the wide potential of web-based IMS applications by illustrating IMS application opportunities through Business Model Canvas. Based on each canvas element, the authors have created IMS classification criteria:

1. Based on the sources involved in IM (Canvas element – Partners): internal; external; mixed.
2. Based on the provided IM functions (Canvas element – Activities): limited; full; extra.
3. Based on the moderation type of IM (Canvas element – Activities): automated; manual; automated/manual.
4. Based on the expected value (Canvas element – Value proposition): IM/innovation management improvements; decision-making improvements; collaboration improvements.
5. Based on the expected ideas (Canvas element – Value proposition): product; process; marketing; organizational.
6. Based on the focus of IM (Canvas element – Relationships): active; passive.
7. Based on the application mode (Canvas element – Segment): special task user; everyday user.
8. Based on the geographical areas (Canvas element – Segment): local; international.
9. Based on the tool provided (Canvas element – Resources): commercial; self-developed.
10. Based on the technological level involved in IM (Canvas element – Channels): real-life; web-based; AI.
11. Based on the pricing method (Canvas element – Costs): usage fee; idea fee; involvement fee; list price; brokerage fee.
12. Based on the reward type for idea creators (Canvas element – Costs): financial rewards; non-financial rewards.
13. Based on the IPR: IPR for creators; IPR for organisation; mixed IPR.

Regarding the IM concept perspective, this study contributes to the theoretical and practical proof of the importance of parities and disparities in IMS – extending the understanding of the just process approach.

Regarding the business models' literature perspective, this article shows how the business model canvas could be conceptualised from an IM perspective.

The main practical contribution is the highlight of practically applicable IM. These classifications could be

used by web-based users to plan IM activities in an organisation, creating for each case the most appropriate combination of IMS application types. For IMS developers, these classifications could help to create new functions, to support the full potential of IMS.

Limitations and further research

There have been 3 main limitations: (1) analysed literature sources amount based on the research design (selected databases, time frame and selection approach); (2) only 100 case studies are included to verify results; (3) classifications based on key partners, channels and relations are used pre-defined from previous studies and not discussed; (4) separate IM models based on Business Model Canvas elements are proposed. Based on the limitations, the authors have developed suggestions for future studies:

1. For future studies, scholars may create alternative concepts for the IM canvas.
2. Create combined IMS models.
3. Research on different IMS types impacts IM results and this also coincides with van den Ende et al. (2015) call to research different IMS types and their results.
4. Based on the activities of the research, different idea generation and idea evaluation methods impact IM results.
5. Additional research should be conducted to explore the effectiveness of the different IM model combinations.

In a future study, the authors plan to attract experts to validate the created canvas, involving experts that represent not only the IM and business model disciplines but also practitioners and representatives of companies that are responsible for IM. This will allow balancing the theoretical findings with the practitioner's views. The authors believe that this paper will stimulate scientific discussions in the academic community and further research about the IM models.

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Author contributions

E. Mikelsone was responsible for the design and development of the data collection, analysis. J. P. Segers was responsible for supervision and data interpretation.

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