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BRIEF INTRODUCTION INTO INFORMATION SYSTEMS & MANAGEMENT RESEARCH IN MEDIA INDUSTRIES

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ABSTRACT

Within the scope of this paper, a new research field – information systems and management in media industries is introduced. The paper illustrates the importance of viewing the media firm as holistic digital firm from the information systems and management perspective. It reviews current literature, research work, and provides an overview of opened research gaps.

Index Terms— information systems, business information management, media firms, media industry.

1. INTRODUCTION

According Gartner as published in Techcrunch, communications media and services are the 3rd largest IT systems spenders with a yearly growth rate of 4.4% with a share of approx. 4 billion \$ in 2011, after banking & securities and manufacturing & natural resources [1]. To state an example, TV industries was faced with tremendous changes in technologies during the past decade, such as the digital switchover, the introduction of HDTV, or the provision of 3D content. Large scale asset repositories and different workflows in the content production process had to be introduced. Nevertheless, also other media industries were faced with similar challenges, as the emergence of digital publishing, digital content distribution, or advancement of in-house customer relationship management infrastructures, or the digitalization of workflows. This change towards digital implies a more holistic view on information systems and management in media industries to provide optimal system solutions, and eventually cut costs. Where other industries are well researched in terms of their IT system solutions, in media industries the discussion around content repositories, media management solutions, and digital workflows seems to be predominant. Within the context of this publication, a more holistic view towards information systems and management in media industries shall be introduced, and emphasize the importance of research of business information management and systems in media industries. The general factors influencing information systems & management in media industries are illustrated in Figure 1.

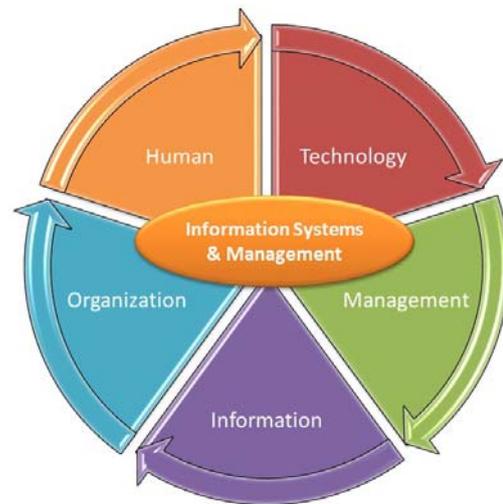


Fig. 1. General factors in inform. systems & management [2,3].

Information management and systems deal with the “process of managing information as a strategic resource for improving organizational performance [and] involves developing strategies and introducing systems and controls to improve information quality over time [2]”. Thus information management and systems deal with information on several management levels of an organizations perusing the goals of the particular organizational level [2,3]. Thus operative staff requires solutions to cope with their daily tasks, but the management is in need to gain more insides into the knowledge of an organization to attract new customers or provide new products to increase the organizations’ performance [2,3].

Figure 2 (based on [3]) illustrates the different types of information systems (e.g. sales management) applied on various levels (e.g. middle management) in an organization across business activities (e.g. sales & marketing). As the figure shows, IT systems are the backbone of the fully digital firm. As mentioned previously, five viewpoints exist [2,3]: technological perspective, human perspective, organizational perspective, management, and an information perspective. The technological perspective deals with the development of software, hardware, algorithms, information networks among other aspects as the core of any

information system. In the center of consideration is information as asset and strategic resource that is processed on data, information, knowledge, and wisdom level [3] (see e.g. [4] for information processing issues).

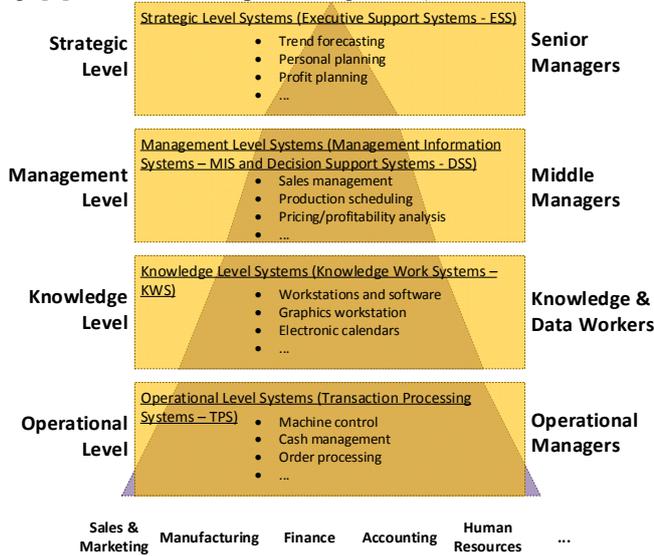


Fig. 2. Types of information systems serving different target groups on various levels across business activities (from [3]).

Nevertheless, introducing latest technologies requires also a human perspective, thus how people deal with these technologies in terms of user-interface development, consumer experience, human information processing capabilities, human resource management, community building processes, among many others [3]. Thus information systems are not solely a matter of technologies, like many engineers would like to envision. They also require the human perspective, and in a further extend to a human-organizational perspective. The organizational perspective deals with the issues of business functions, workflows, processes, training, among many others. Besides organizational aspects, management issues, and how manager deal with the information that is provided by IT systems on various levels of the organization is another key-point of information systems and management research.

The key-issues of information systems & management for non-media company specific level are (compiled from [2] and [3]): *efficient production processes; creation of the digital firm; adding and creating of new value; cost reductions and increasing revenue; risk management; interaction with consumers and providing service; coordinating the organizations' departments; organizing customers, employees, and partners; customized products and packages; managing information quality; information centeredness (records, lifecycle, orientation, perception); teaching and skills development of employees; information strategies and processes, ...*

Within the scope of the next sections, the focus is on the media industry particular needs in terms of information

systems and management, application areas, requirements, and key-literature in this field.

2. MEDIA INDUSTRY AND IS & MANAGEMENT

The particular product in media industry is content requiring its production, processing, distribution, and management. Thus, on operational level, the core of media industry is any information architecture dealing with content alongside with other information systems that were introduced on the basis of other than media industries. A very first consideration of introducing business information management & systems in the domain of media industries, is the particular industry segment. Each segment requires a particular use of information systems especially on operational and knowledge level. The most significant segments are broadcasting, newspapers & magazines, production industries, advertising & ad-agencies, publishing, internet & new media, and gaming. Each of these segments requires a different workflow for content processing, that also extends towards a different culture, ways of working, and how the audience perceives the content.

2.1. Media Industry Application Areas of IS Research

Currently there exist many examples in industry that develop information systems for media industries. In the following a few examples are enlisted (from [5], [6], and a search with [7]): *marketing and targeted marketing for media services and consumer feedback management; social media analysis and marketing; customer intelligence either in real-time / non-real-time; digital content End-to-End; understanding audiences, advertisement statistics, audience trends, and audience preferences; data warehousing; digital archiving & asset management; subscriber management & marketing; personalized and individualized offerings to increase consumer loyalty; target niche groups and create new revenue streams; increase revenue from intellectual property (IP) rights and royalties; financial performance management; collaborative productions; marketing and targeted marketing for media services and consumer feedback management; social media analysis and marketing; customer intelligence either in real-time / non-real-time; digital content End-to-End; understanding audiences, advertisement statistics, audience trends, and audience preferences; data warehousing; digital archiving & asset management; subscriber management & marketing; personalized and individualized offerings to increase consumer loyalty; target niche groups and create new revenue streams; increase revenue from intellectual property (IP) rights and royalties; financial performance management; and collaborative productions; ...*

2.2. Challenges for IS Research in Media Industry

During the recent decade traditional media industries were faced with many challenges. The major one was the transformation from old media industries towards new media industries, and creating a digital media firm. This implicates many emerging challenges for the industry segment media:

- tremendous amount of new media technologies (e.g. compression, image and video processing, ...) requiring an integration in legacy systems;
- fully digital asset management and metadata solutions suitable for complete digital workflows;
- transformation of traditional ways of working towards a fully digital way of working;
- changes in management of organization to cope with the digital ways of management;
- convergence of technologies and management on various different levels;
- etc.

2.3. Method and Hypothesis

The approach of this paper is primarily based on a qualitative approach, in principle a literature analysis of selected references. The paper shall examine the potential of IS research in media industry. The principle hypothesis of this paper:

- (1) media industry requires information systems suitable to their workflows, particular media segment, and organization;
- (2) the convergence of new forms of media, and commonly understood “traditional” media industries is tricky and difficult to gap;
- (3) information management and systems are a matter of organization and culture particular suitable for the creative in media industry;
- (4) traditional media industries simply don’t know how to transform their industries towards digital firms in terms of organization, workflows, social aspects, customer viewpoint, and traditional ways of working;
- (5) key-issues of information management and systems research cover several business functions & activities, integration functions across business functions, media industry segment particular requirements, and global – inter-organizational functions;

3. PARTICULAR NEEDS IN MEDIA INDUSTRIES

To analyze the particularities of IS and IM in media industries, let’s categorize the issues as follows (extended and adapted from [3]):

- **types of information systems:** categorization of IS according levels of application in an organizational hierarchy (from operational level to strategic level) – see Table 1;

- **business functions & activities:** categorization of IS according business functions and activities inside an organizations (e.g. marketing, human resource management);
- **across business functions & activities:** IS across single business functions to integrate various business functions and activities across departments within an organization (e.g. supply chain management, customer relationship management);
- **global and inter-organizational:** IS coping with international organizational models (e.g. franchising), global IT systems (e.g. Internet), and inter-organization information exchange;
- **media genre specific infrastructures:** media genre specific IS architectures as e.g. in TV broadcasting, or gaming industry;

3.1. Types of Information Systems (IS)

A compilation of existing literature and practical applications in the area of information management and systems are illustrated in Table 1. Firstly, let’s consider practical applications coming from industries.

Table 1. Organizational levels of IS in media (extended from [3])

IS Systems Level	Practical Scenarios
<i>Operational Level</i>	order processing, transactional services, online subscriptions, audience measurement, simple sales management functions, ...
<i>Knowledge Level</i>	tools for content production, organization of daily tasks, workstation, A/V tools, software tools, work organization tools, ...
<i>Management Level</i>	audience analysis, rating analysis, advertising affect analysis budgeting, production planning, human resource management, inventory,
<i>Strategic Level</i>	long term strategic goals, content forms, forecasting, audience forecasting, project planning, portfolio planning, competition analysis, regulation policies, standardization policies, ...

3.1. Business Functions & Activities

3.1.1. Sales and Marketing

IS systems for sales and marketing assist in promotion, order processing, market analysis, price determination, demand analysis, sales forecasting, and the identification of consumer needs. Systems supporting business activities on each organizational level shall increase the companies’ performance [3] (see especially [3] p. 47). Sales and marketing in media industries has very particular characteristics, due to the dual market – selling customers to advertisers, and selling content to consumers, which always

has to be kept in mind. On the other hand sales and marketing relates to selling the audience to advertisers and advertising networks; and on the other hand content needs to be sold to end-consumers. The dual market especially emphasizes the examination of “the relationship between [...] advertisers, media firms, consumers, and audience measurement firms” [8]. Audience rating analysis, dealing with metrics of media reach, are a cornerstone in the dual market (see e.g. [9]).

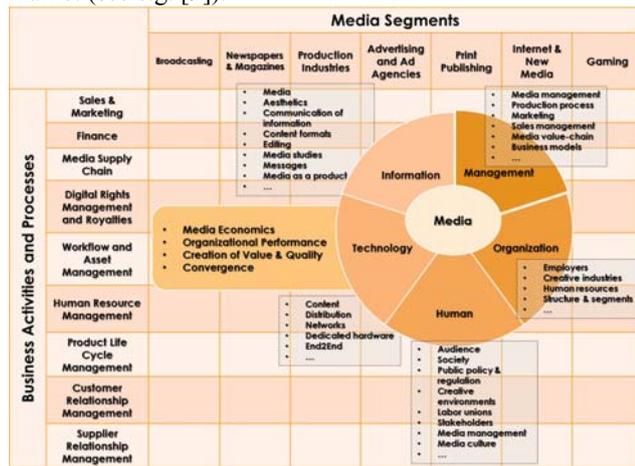


Fig. 3. Overview of business activities, media segments, and their relation to various aspects of information management & systems.

On operational level sales and marketing services in media industry center around transactional services, such as subscription handling, e-business and alike services, digital content order processing, and simple functions related to sales management. Traditional media are researched in terms of audience analysis, as e.g. the factors that lead to a motion picture success at the box-office [10]. Audience analysis on new media, and Internet media are especially problematic, however, basic research works attempt to define metrics of how to measure online audiences in today’s world of online media [11].

3.1.2. Content Production, Pre- and Post-Production

Content productions and IS infrastructures are very particular in various media genres, and can be compared to manufacturing and production in other industries. Within the scope of this paper we would like to avoid a discussion into this direction as well and only would like to pinpoint to one case for a motion picture production [12].

3.1.3. Firm’s Financial Functions

The most prominent function of IS systems in industry is financing and accounting, which offers a wide range of areas. A few particular examples in media industries are media finance networks (see e.g. [13]), different types of TV funding models (see e.g. [14]), and advertising & media markets to mention a few examples [15].

3.1.4. Human Resource Management

Human resource management deals with the attraction, development, maintenance, and support of the employees of a media firm [3]. Especially freelance workers and their coordination are one particular example in media industries (see e.g. [16]).

3.2. IS Across Business Functions & Activities

3.2.1. Media Supply Chain

In media industries, the supply chain aligns from production, to distribution, towards monetization. Most commonly we can define the supply chain as end-to-end industry [17]. Particular novelties providing a wide area for research is the integration of social networks (see e.g. [18] or [19]) that offers a wide area of research.

3.2.2. Digital Rights Management (DRM)

One IS function across business functions & activities is digital rights management. Digital rights management deals with the protection of content across the media supply chain. It’s a rather tricky and still unsolved problem in media industries, as many models did not work out in reality, leading to statements and remarks, that piracy could destroy media industries completely [20] or any systems related to DRM should be removed completely as e.g. EMI did [21].

3.2.3. Customer Relationship Management

Customer Relationship Management (CRM) deals with strategies that are aiming to add value for customers creating a profit for the firm, as well as obtaining valuable information about the customers [22]. In media industry particularly the current trend is towards media services in the cloud (see e.g. [23]), and the challenge how media productions can be based on the crowd (see e.g. [24]).

3.2.4. Supplier Relationship Management

Current examples for supplier relationship management in media industry extend towards decision support for business models (see [25]), or competition analysis (see [26]).

3.2.5. Product Life Cycle Management

Particular application scenarios for product life-cycle management are e.g. online gambling (see e.g. [27]), or the discussions around virtual goods (see e.g. [28]).

3.2.6. Workflow, Asset, and Content Management

Workflows, thus ways how to work, the sub-division in tasks, and processes is the dominant way how media are created. There are many media genre specific processes and ways how to arrange the work. From the IS perspective a content centric workflow (see e.g. [29], and [30]) and a metadata based workflow are typical for the industry (see e.g. [31]).

3.4. Global and Intra-Organizational

3.4.1. Licensing & Royalties

Licensing and royalties are one of the key-mechanism in media industries to share the revenues of the content value-chain and to protect content on a legal basis. From the IS perspective licensing & royalties apply mostly on management level, where these can be considered as capital investments, cost contract analysis, profitability analysis, or budgeting, as e.g. broadcasting rights (see e.g. [32]). Nevertheless a few particular current issues in this field are licensing models coming from the software engineering field, and how these might be adapted in the field of media, as e.g. open source (see e.g. [33]). From a human perspective a current issue is licensing and copyright protection of content contributed to the public or on user generated platforms [34], or how the media industry dominant sector of freelance work is treated with (see e.g. [16]). In this context, open access is another issue to be discussed on an IS level [35].

3.4.2. Convergence

Convergence deals with merging various levels such as technology level, media industry level, consumer level, and organizational and management levels. Research in the IS field has rather huge potentials, as e.g. the forthcoming text book [36] will demonstrate.

3.5. Media Genre Specific IS Infrastructures

Normally each media genre has particular system infrastructures and technological solutions. Most of them are standardized via standardization bodies as e.g. SMPTE, MPEG, or DVB. Nevertheless, this particular discussion topic would go far beyond the scope of this publication, and will be discussed within the scope of other research work. As one example for an industrial IS solution that can be applied across various media industries, we solely would like to mention SAP as solutions provider (see e.g. [5]).

4. CONCLUSIONS

The scope of this publication is rather wide, and shall represent a very brief introduction in the field of information systems in media industries. It shall be underlined, that many details are still left out for discussions. Nevertheless, the publication nicely draws an outline on how to utilize information management and systems in media industries. It shall act as basic work for future research work in particular areas, especially to make the research community aware about this matter.

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