

**Proceedings of  
9th European Conference  
on  
IS Management  
and Evaluation**

**ECIME 2015**

**The University of West England**

**UK**

**21-22 September 2015**

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## Preface

The 9th European Conference on Information Management and Evaluation (ECIME) is being hosted this year by the University of the West of England, Bristol, UK on the 21-22 September 2015. The Conference Chair is Dr Elias Pimenidis, and the Programme Chair is Dr Mohammed Odeh both from the host University.

ECIME provides an opportunity for individuals researching and working in the broad field of information systems management, including IT evaluation to come together to exchange ideas and discuss current research in the field. This has developed into a particularly important forum for the present era, where the modern challenges of managing information and evaluating the effectiveness of related technologies are constantly evolving in the world of Big Data and Cloud Computing. We hope that this year's conference will provide you with plenty of opportunities to share your expertise with colleagues from around the world.

The keynote speakers for the Conference are Professor Haris Mouratidis, from the School of Computing, Engineering and Mathematics, University of Brighton, UK who will address the topic "*Rethinking Information Systems Security*", Dr Mohammed Odeh, from the University of the West of England, Bristol, UK and Dr. Mario Kossmann from Airbus, UK who will talk about "*The Significance of Information Systems Management and Evaluation in the Aerospace Industry*'

ECIME 2015 received an initial submission of 55 abstracts. After the double-blind peer review process 28 academic Research papers, 5 PhD Research papers, 1 Masters Research paper and 3 Work in Progress papers have been accepted for these Conference Proceedings. These papers represent research from around the world, including Austria, Botswana, Cyprus, Czech Republic, Ireland, Japan, Kuwait, New Zealand, Norway, Poland, Portugal, Slovakia, Russia, South Africa, South Korea, Sweden, The Netherlands, UK and the USA.

We wish you a most interesting conference.

Dr Elias Pimenidis and Dr Mohammed Odeh  
September 2015

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## Biographies

### Conference Chair



**Dr Elias Pimenidis**, Elias started his working life as a projects engineer in heavy manufacturing and has been involved in the design and implementation of production planning, ERP and logistics control systems in manufacturing plants over a period of ten years. He joined the University of the West of England in 2014 where he is a senior lecturer and a member of the Software Engineering Research Group. Elias has been a member of the programme committee of ECIME and its predecessor ECITE since 2003. He has published widely with more than 90 papers in refereed journals and conference proceedings.

### Programme Chair



**Dr Mohammed Odeh** is a Reader in Software Engineering and Head of the Software Engineering Research Group in the Faculty of Environment and Technology of the University of West of England. He has more than 29 years of research and development experience in the engineering of software systems with an in-depth interest in Systems of Systems software engineering, Knowledge-driven Requirements Engineering and Bridging the Gap between Business Processes and Computer-based Systems. He has supervised over 11 PhD students to successful completion and is currently supervising further six PhD students in software engineering and other related disciplines. Mohammed has been acting as invited PhD examiner externally and internally, and as an invited keynote speaker in international conferences and as associate editor on international journals. He was co-organiser of the 5th IEEE CloudCom Conference in December 2013 and introduced the first Requirements Engineering for Cloud Computing (RECC) in the IEEE CloudCom Conference. He has been the UWE principal investigator on the OntoREM project and as a joint inventor of OntoREM with Dr. Kossmann from Airbus, and with two patent applications filed in the US. Among other research output include 40 refereed journal papers and books (including books and research work to appear) and 38 conference papers. He is an associate editor of the INCOSE/Wiley Systems Engineering and the IAjit journals. He sits on the steering committee of the ACIT conference series. He has been UWE Bristol co-investigator on EU FP5 and FP6 projects.

### Keynote Speakers



**Dr Haris Mouratidis** is Professor of Software Systems Engineering at the School of Computing, Engineering and Mathematics, at the University of Brighton, U.K. He holds a B.Eng. (Hons) from the University of Wales, Swansea (UK), and a M.Sc. and PhD from the University of Sheffield (UK). He is also fellow of the Higher Education Academy (HEA) and Professional Member of the British Computer Society (BCS). Haris has been a visiting researcher at the National Institute of Informatics (NII), Japan, and a visiting fellow at the British Telecom (BT), U.K and the University College London, U.K. He is visiting professor at the University of the Aegean, Greece. His research interests lie in the area of secure software systems engineering, requirements engineering, and information systems development. He is interested in developing methodologies, modelling languages, ontologies, tools and platforms to support the analysis, design, monitoring of security, privacy, risk and trust for large-scale complex software systems. He has published more than 130 papers (h-index 21) and he has secured funding as Principal Investigator from national (Engineering and Physical Sciences Research Council (EPSRC), Royal Academy of Engineering, Technology Strategy Board (TSB)) and international (EU, NII) funding bodies as well as industrial funding (British Telecom, ELC, Powerchex, FORD) towards his research. His "Powerchex KTP" project was finalist for the best 2012 UK National Knowledge Transfer Partnership TSB award. He has acted as evaluator for national and international funding bodies (e.g. EPSRC, HEA, and EU) and invited subject expert for organisations (e.g. TSB, NATO). He is member of the ERCIM Security and Trust Management Working Group and of the IFIP Working Group 8.1: Design and Evaluation of Information Systems. He is on the editorial boards of the Requirements Engineering Journal and the International Journal of Information System Modeling and Design and he has been involved in the organization of various events related to his research interests. He was the General co-Chair of CAiSE'14.



**Dr. Mario Kossmann** (ESEP) is an experienced Systems Engineer and Capability Integrator for Airbus, having previously worked for Blohm & Voss as Systems Engineer, Technical Manager, and Consultant in Services Marketing. He has served as a naval officer with the German and French navies, and was awarded an MEng in Aerospace Technology from the University of the Federal Armed Forces in Munich (Germany), an MBA from the University of Warwick (UK) and a Ph.D. in Requirements Engineering from the University of the West of England. He is the author of the books *Delivering Excellent Service Quality in Aviation* (Ashgate 2006) and *Requirements Management – How to ensure that you achieve what you need from your projects* (Gower 2013), as well as numerous research publications in the fields of Systems Engineering, Software Engineering and Project Management. Mario is also a certified Project Manager and Expert Systems Engineering Professional



## **Mini Track Chairs**



**Dr. Elena Serova** works in International School of Economics and Politics, High Economics School of St. Petersburg State University of Economics in Russia. Her role combines teaching and research. Her research interests are related to Information Management, Marketing Information Management, Business Models, Economics of Innovation and Knowledge Management. She has co-authored a book and contributed chapters to several books and collections of essays, and she is a regular key presenter at national and international conferences and workshops. As a research active academic with a number of PhD Students under her supervision, Elena is focusing on Spatial Economics, Modelling of Complex

Management Systems, Marketing Information Systems, Business Models in Global Environment and Architectural Design of Management Information Systems.



**Danilo Piaggese** is Managing Director of the Fondazione for the Renaissance of the Americas (FRAmericas) a non-for profit organization. FRAmericas focuses on Knowledge Society, Knowledge Economy, E-governance, ICT for development, and innovation for development. He founded and directs FRA's International Knowledge Economy Program (IKEP), working with multilateral and bilateral cooperation to support development projects where ICT, innovation and the principles of the Knowledge Economy can be instrumental for achieving socio-economic growth. He is also the founder of the "ICT for Development International School" or ICT4DEVIS a higher education summer program focusing on training on

ICT for development, hosted by prestigious international Institutions and Universities. At FRAmericas, Mr. Piaggese brings into bearing his experience in the private sector (Telecom Italia) and with multi-lateral development organizations (Inter-American Development Bank as Chief of its ICT4DEV Division), and previously, the United Nations' Food & Agriculture Organization).



**Dr Gunilla Myreteg** is Assistant Professor at Uppsala University, Sweden. Her research interest includes how information technologies, especially ERP systems, are designed and used in organizations for a variety of information purposes. Her research concerns foremost the problems and possibilities of the manufacturing industry, however her current research also deals with information needs and communication related to health care organizations.



**Dr Karen Neville**, Senior Lecturer, Director of the Centre for Security & Emergency Management Research (CSEM), BIS, University College Cork, Ireland



**Dr Ciara Heavin**, College Lecturer, Director of the Health Information Systems Research Centre (HISRC), BIS, University College Cork, Ireland

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## **Biographies of Presenting Authors**

**Olusegun Ademolu Ajigini** lectures in Computer Security at the School of Computing, University of South Africa, Florida Campus, South Africa. His areas of research interests include Information Security, Sensitive Data Protection, Business Intelligence Analytics, Big Data Analytics and Cyber security. His industrial experience includes working as a Business Intelligence (BI) Analyst, Data Analyst and Information Technology Senior Manager.

**Ahmed AlHarbi** is a PhD candidate in Business Information Systems (BIS), University College Cork (UCC). Research interests include understanding and investigation of the role of IT capabilities in supporting the customer-focused strategies and customer experience management (CEM).

**Alexis Amaye** is a Ph.D. student at University College Cork in Business Information Systems with particular interest in crisis management decision making and system development. Prior to UCC, she worked for 10 years as an emergency manager in the public and private sectors in the USA. Alexis holds a MPH from Tulane University in Disaster Management.

**Maria Bergenstjerna** is a program coordinator, PhD candidate and part of the IT management research group, Department of Applied IT, University of Gothenburg, Sweden. Her research interest is in the field of informatics; the management of coordinated development of business, information systems and knowledge. As lecturer, she has engaged in the IT management courses for several years.

**Terese Besker** has an extensive and long experience in systems development area, with a primary focus on real-time applications with base in automation and supply chain management. She studies in parallel with her profession an IT management master, with the aim of strengthening and broadens her IT management skills.

**Rebecca Casey** is a full-time doctoral researcher at Northumbria University. Her research interests include benefits realisation, IS evaluation, project management, critical research and socio-materiality. Rebecca has seven years of experience undertaking international qualitative and quantitative academic research.

**Chrysostomi Maria Diakou** is currently a Ph.D. student at the University of Nicosia. She holds an MA in Innovation & Brand Management and BA in 3D Design. She is actively involved in European research actions. Important research endeavours for her doctoral research arise from fields such as change management, decision science, risk management and information systems.

**Simon Dwane** has completed a BSc in Applied Psychology and recently finished an MSc in Engineering Psychology with Ergonomics. He is currently working as a Research Assistant at University College Cork's (UCC) ASSERT Centre under the project S-HELP, developing a training course for the purpose of improving decision making of response organisations in emergency situations.

**Ahmed Elmorshidy** is the head of the Accounting & MIS Department in the College of Business Administration at Gulf University in Kuwait. Dr. Elmorshidy received a Ph.D. in (MIS) Management of Information Systems from Claremont Graduate University, California, USA and an M.A. and an MBA from Webster University, U.S.A. He has over 25 publications in peer-reviewed journals and conference proceedings.

**Sunet Eybers** has been an industry practitioner focusing on large scale Business Intelligence Systems implementations across various industries in South Africa. She has fulfilled many roles, including developer, business analyst, project manager, and BI manager. She recently joined the University of Pretoria as Senior Lecturer in the Department of Informatics after obtaining a PhD degree in Information Systems.

**Oduonke Eytayo** is a Senior Lecturer in the Department of Computer Science, University of Botswana. She holds a Bachelor's degree in Computer Science and Master's degree in Information Science from the University of Ibadan, Doctor of Philosophy in Information Studies from the University of Botswana. Her research area is in user studies and evaluation.

**Dr Apostolos (Paul) Giannakopoulos** has been in education for more than 35 years, teaching Mathematics, Physical Science, Computer Literacy and Numerical Methods in high schools and universities. His research interests are problem solving and critical thinking applied in mathematics and other disciplines (knowledge management, intellectual capital, physics).

**Behrooz Golshan** is a PhD student at the informatics Department of Linnaeus University in Växjö Sweden. His current research project is on the impact of IT-capabilities on Business Model reconfigurations. Prior to his academic career, he worked as a software developer, where he found his passion for managerial aspect of Information Technologies.

**António Guerreiro** is Assistant Professor in the Department of Management, University of Évora, Portugal, and President of the Pedagogic Council of the School of Social Sciences, 2013-2015. He holds a MSc. in Organization & Information Systems and a PhD in Management by the University of Évora, and was research student at Queen's University at Belfast, UK (2003/2005).

**Aida Hadzic** is a PhD student and program coordinator in the Department of Applied IT, University of Gothenburg, Sweden. She has a system science background and a second level education in the field of IT Management. Aida is part of the IT management research group and is studying issues related to management and architectural design of both existing and future IT investments.

**Douglas Hawley** is an Assistant Professor of Computer Science at Northwest Missouri State University. From 2007 until 2014, he was an IT Supervisor for the Nucor Bar Mill Group. Hawley holds a Master's Degree in Computer Science from the University of Missouri-Kansas City, and a Doctorate in Leadership from the University of Missouri.

**Jerry Horgan** has over 10 years of expertise in systems and network administration. He manages the TSSG's Data Centre as the Waterford Institute of Technology, Ireland. He holds a BSc in Computer Science, an MSc in Communications Software Develop, an MSc in IT Management and a number of industrial qualifications including Cisco's CCNA and CCNP.

**Jwan Khisro** has a master's degree in informatics and is part of the IT management research group, Department of Applied IT, Gothenburg University, Gothenburg, Sweden. Her research interest is in the field of informatics; the management of coordinated development of business, information system and knowledge in healthcare sector.

**Soudabeh Khodambashi** is a Ph.D. candidate and teacher assistant at the Norwegian University of Science and Technology (NTNU). Her research background is in the domain of clinical process analysis and re-engineering, Information system evaluation, clinical guideline development requirement engineering, clinical decision support systems and Lean management.

**Sungtae Kim** is an Associate Research Fellow in Korea Institute for Defense Analyses(KIDA). He received M.S. and B.S. degree in Computer Science & Engineering from Seoul National University and Inha University respectively. His research interests include information system evaluation, Informatization evaluation, ICT policy, Supervision of ICT project, Big Data, Ontology.

**Erdelina Kurti** is a doctoral student in the Department of Informatics, Linnaeus University, Sweden. Her research focuses on exploring the challenges and success factors in the process of digital business model transformation with special focus on managerial cognition and its dominant logic(s), as part of the firm's inertia that enables and hinders the transformation.

**Porya Mohajer Soltani** is a research student at the University of Gothenburg and a business developer at Angered Hospital. His field of research is digital innovation and its application within the health industry. His main areas of responsibility as a business developer are development of management system and process development.

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**Ngoc Anh Nguyen** has a background in e-government and information systems with a masters degree on Information Technology. After five years working in this field, he found himself curious about how people adopt and accept using a certain technology. Due to this, he has enrolled in the PhD course at Waseda University, Japan, to further his research.

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# Case Management as a Tool for Forming Corporate Knowledge

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**Abstract:** Case Management is the management of collaborative processes that coordinate content, knowledge, and resources to progress a business to achieve a particular goal, where the path of execution is often unpredictable and where human judgment has significant influence for determination of how the end goal can be achieved. The key characteristics of Case Management include: information complexity, knowledge-intensive, and variability. The knowledge-driven economy brings new challenges for business. Markets and business-processes are becoming more global, customers are more demanding, and product life cycles are shortening. The complexity of technologies, including Information Communication Technologies (ICT), is increasing. So while the knowledge economy represents new opportunities, certain actions are needed to support and take advantage of these developments. This evolution can be enhanced by the adoption of Case Management that has reduced the cost of gathering and disseminating knowledge. The contribution of Advanced Case Management (ACM) to innovation has been achieved most notably by reducing transaction costs between companies and other actors, especially in areas such as information search and buying. The main goal of this theoretical study is to evaluate the role of contemporary information systems (IS) and technologies for supporting Case Management as tool for forming corporate knowledge. Attention of many scientists and researchers in this subject field is focused on the study of Customer Relationship Management (CRM), Business Process Management (BPM), and Enterprise Content Management (ECM) or Electronic Document and Record Management (EDRMS) systems. But these technologies and systems are not sufficient to address the key problems. Enterprise Content Management and Business Process Management (BPM) with specific support for knowledge intensive processes can be discussed as more appropriate solution to Case Management successful implementation and use. BPM-based Case Management can take into account unpredictable or uncertain nature of cases and effectively combine processes and knowledge. It can consider as innovation in Data Management.

**Keywords:** knowledge, data management, case management, business process management, enterprise content management

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## 1. Introduction

The term "knowledge economy" was introduced in the 1960s to describe a transition from traditional economies to ones where the production, dissemination, and use of knowledge are very significant, nowadays the term "knowledge economy" is often used (Drucker, 1969; Romer, 2001; Grant, 1993; Snellman and Powell, 2004). We have now progressed from the knowledge-based economy to the knowledge-driven economy. Moreover, it can be accumulated in a powerful system of national and international resources, paying its way many times and bringing profit. The term "innovation economy" is also used to describe a new form of economic organization that highlights a special role of knowledge and innovation, primarily scientific knowledge (Davenport, Leibold, and Voelpel, 2006; Nevel, Roberson, Scarbrough, Swan, 2009; Goffin and Mitchell, 2005).

So while the knowledge economy represents new opportunities, certain actions are needed to support and take advantage of these developments. This evolution can be enhanced by the adoption of Case Management that is able to reduce the cost of gathering and disseminating knowledge. The contribution of Advanced (Adaptive) Case Management (ACM) to innovation is achieved most notably by reducing transaction costs between companies and other business actors, especially in areas such as information search and buying. Now Case Management can be discussed as an effective tool for forming corporate knowledge.

This paper deals with the issues of Russian and international researches in the field of CM implementation and how it can be properly supported by information technologies. It is theoretical study based on literature review, analysis of large volumes of information, and findings of investigations in this field. The objective of this paper is consideration the features of contemporary ICT and systems applications for supporting of knowledge-oriented Case Management.

The research problem is focused on the Case Management applying to supporting knowledge-intensive processes. In other words, the problem the author works with here is: How organizations can successfully use Case Management for forming corporate knowledge.

The research questions are:

- In what way organizations can capture, gather, and share knowledge with the use of Case Management?
- How Case Management system implementations support knowledge workers, improve quality of client care, and achieve efficiency of knowledge processes?
- And finally, what classes of information systems are more appropriate for Case Management support?

The rest of this paper is structured as follows: Literature review, Case Management Systems theoretical background, BPM-based Case Management, Adaptive Case Management and Enterprise Content Management Systems (ECMS), Practices of case management implementation and Case Management System Market, Conclusion.

## **2. Literature review**

Throughout the literature Case Management has been considered as a strategy (Ross et al., 2011), a process (Davenport and Grover, 2001; White, 2009), and technology (Davenport, 2011; De Man, 2009; Reijers et al, 2003; Van der Aalst et al., 2005; Weber et al, 2010). The more widely used definition is provided by the Case Management Society of America (CMSA): “Case management is a collaborative process of assessment, planning, facilitation and advocacy for options and services to meet an individual’s health needs through communication and available resources to promote quality cost-effective outcomes” (CMSA, 2009). This is a standard definition used by the authors from varying business spheres (without the healthcare context), for example, technology/process management literature (De Man, 2009). Previously, custom-built Case Management solutions could be found across a number of traditional domains such as healthcare, social care, legal practices and government cases, but more recently renewed efforts have been made to apply Case Management applications in new knowledge-intensive domains and strategic areas such as project management, incident management, investigations, and audit (Janachkova and Li, 2013 ).

Case Management is the management of long-lived collaborative processes that coordinate knowledge, content, correspondence and resources to progress a case to achieve a particular goal; where the path of execution cannot be predetermined in advance of execution; where human judgment is required to determine how the end goal can be achieved; and where the state of a case can be altered by external out-of-band events (White M., 2009). Case Management is vital to the successful work of many companies, and is considered as an important factor to supporting knowledge intensive process. Davenport (2011) and Richardson and Hope (2003) state that Case Management recognizes the importance of knowledgeable case managers for better customer service who, instead of being eliminated through process automation, are given the authority to make decisions about the progress of client cases and coordinate the service provision with other parts of the organisation. With the emergence of knowledge work, Case Management was picked up by knowledge management experts and it was seen to take on a new role – that of improving knowledge workers’ productivity (Davenport, 2011; Richardson and Hope, 2003).

The key characteristics of Case Management include: information complexity, knowledge-intensive, and variability.

CMSA (2009) suggest that the goals of Case Management are: The Case Manager shall facilitate coordination, communication, and collaboration with Consumers, providers, ancillary services, and others in order to achieve goals and maximize positive Consumer outcomes based upon individual assessments of Consumers’ needs. According to Case management Society of America (2009) there are sixteen CM functions, the author believes that the main of them include:

- Use a Consumer-centred, strengths-based, collaborative partnership approach;
- Use a comprehensive, holistic approach;
- Practice cultural competence, with awareness and respect for diversity;
- Facilitate informed choice, consent, and decision-making;
- Pursue professional excellence and maintain competence in practice; and/or
- Use process and outcome measurement, evaluation, and management tools to improve quality performance.

The term Adaptive Case Management (ACM) was proposed by Workflow Management Coalition (WfMC) in 2010. Adaptive Case Management is information technology that exposes structured and unstructured business information (business data and content) and allows structured (business) and unstructured (social) organizations to execute work (routine and emergent processes) in a secure but transparent manner (WfMC, 2010).

Adaptive Case Management is an approach to work that supports knowledge workers to get their work done; it's a technology that allows managing the process of solving the problem, depending on the situation. One of the main characteristics of ACM is flexibility.

Production Case Management (PCM) is an approach to supporting knowledge workers which is programmed by specially-trained technical people (programmers) to produce a Case Management application. That application is deployed for use by knowledge workers to get their work done. The application offers collections of operations that the knowledge worker can select to use or not use depending on the specific needs of the case (WfMC, 2010).

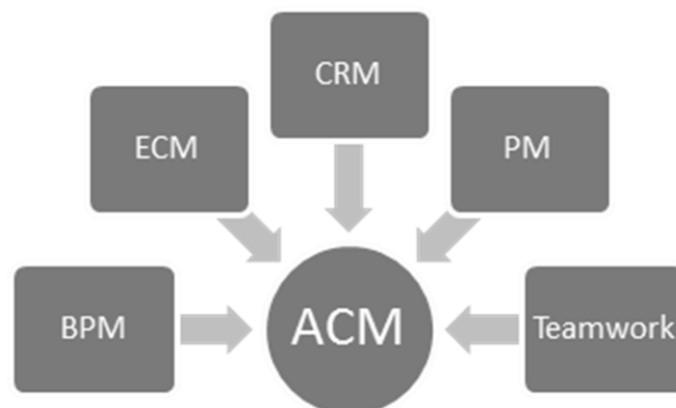
### 3. Case management systems

The main reasons for implementation of Case Management systems are limited data collection and data extraction capabilities. One reason else for this is poor coordination and communication between business actors, in particular uncoordinated transitions of clients between providers and also duplication of business-processes across different departments because of inability to share information and work collaboratively.

The first Information Systems for Case Management supporting appeared at the end of last century, in the early 1990s. They were starting with client databases, calendar, documents, and basic reporting tools. At the last ten years IS supporting Case Management practices have developed significantly. Case management has evolved into a knowledge-based system, which leverages multiple technologies (such as BPM, content management, document management, collaboration tools and predictive analytics) to analyse and bring structure to knowledge-intensive processes (Forrester, 2010; Davenport 2011). However, such systems are only beginning to arise and scientific researches and empirical data will be required to validate these claims and assess the effectiveness of newly emerging Case Management systems on the market.

Today, ACM systems are at the junction of classic enterprise applications (Figure 1):

- Business Process Management (BPM)
- Enterprise Content Management (ECM)
- Customer Relationship Management (CRM)
- Project Management (PM)
- Teamwork



**Figure 1:** Adaptive case management systems

But these technologies and systems are not sufficient to address the key problems, which are mentioned above: limited data collection and data extraction capabilities, poor coordination and communication between business actors, in particular uncoordinated transitions of clients between providers and also duplication of business-processes across different departments because of inability to share information and work collaboratively. At

the same time, Business Process Management and Content Management Systems have the necessary functional capabilities for solving such kind of problems. BPM and ECMS with specific support for knowledge intensive processes can be discussed as the more appropriate solutions to Case Management.

One of the key advantages of CM applications is that they enable more easy integration between departments than many other systems approaches. As a rule, Case Management is implemented on client level and doesn't interfere with existing organisational processes and structures. This approach ensures smooth integration between departments whose internal processes might be drastically different.

The other challenge of Case Management applying is cultural. The implementation of CM systems requires consolidation of infrastructure and people to understand the impact of modern technologies on everyday business practices and the need for data management and analysis.

Organizations can successfully use Case Management for forming corporate knowledge by using features and capabilities of modern software, such as BPM and ECM systems.

### **3.1 BPM-based case management**

Business Process Management is a systematic approach to improving an organization's business processes. BPM activities seek to make business processes more effective, more efficient, and more cable of adapting to an ever-changing environment.

BPM systems and ACM are useful for different kinds of business situations:

- Highly predictable and highly repeatable business situations are best supported with BPM.
- Unpredictable and unrepeatable business situations are best handled with ACM.

Comparison of the ACM and BPM leads to the following conclusions (WfMC, Workflow Management Coalition 2010):

- Both are used to help workers within organization to coordinate better, to achieve goals more efficiently, and used to better meet the needs of their customers.
- Both involve data, process, roles, communications, integration and analytics.
- However, they take very different approaches to doing this which is effective in different business situations.

As opposed to traditional systems of business processes automation, in BPM-based Case Management systems the emphasis is not on the observance of a fixed sequence of works, but on data organization, their completeness and accessibility for participants in a business process. Under "data" is meant not only documents, but also information about business processes: tasks, user roles, work history, events that influence the process. . BPM-based Case Management can take into account unpredictable or uncertain nature of cases and effectively combine processes and knowledge. It can consider as innovation in Data Management.

### **3.2 Adaptive case management and enterprise content management systems**

For effective ECMS implementation for CM support one shall take into account the following provisions:

- Specificity of applications. Content management automation applications and applied systems are entity-specific.
- Unified information space organization necessity. One must pay special attention to generalization of mechanisms of search, knowledge acquisition, statistical information accumulation and process analysis. Notably, it is important to have access to information on employees' participation in various business processes. Availability of such integrated mechanisms enables acquisition of essentially new information on the entity work.
- Need for flexible application modification tools. The main task of document management automation consists in propagation of automation to involve the managerial process formalized part. However, the formalization process proper is periodical and iterative. During a specific process implementation one discovers its weak points and realizes the necessity of its structural changes.



- Complexity of managing an array of applications. In case of progressive implementation of numerous applications automating specific document processing tasks that are not integrated into a unified system their support becomes critically more complicated and costly. This may finally render null the automation effect and requires implementation of applications within the framework of a unified administration and support system.

All functions of an electronic document management system are to be classified into eight groups (Serova, 2011):

- Functions of navigation and organization of access to information ensure convenient user access to different applications and include such basic tools as personal and group queues of document processing jobs, tools for navigation within the system data hierarchy, data representation adjustment possibility, document processing functions initialization tools etc.
- Functions of document accounting or file deployment tools provide for recording documents forwarding information, document and reference attributes, directory maintenance, document account cards development, definition of a business logic for the account cards processing (field value verification, provision for uniqueness, automatic number assignment), definition of document processing operations, support of document processing life cycle etc.
- Functions of work with a document archive include storage of document files, lock and version management, storage costs optimization. Here also belong document text scanning and recognition etc.
- Functions of documents routing and status control provide for delivery of documents to users' workplaces, enable document processing in online and offline modes (via e-mail), collection of information on users' actions, control of current document status etc.
- Business processes automation tools include business process modeling tools, imitation modeling tools and an environment for process actualization and monitoring as well as tools for accumulating statistical data on process performance and their costs and efficiency analysis.
- Group work organization tools include tools for group discussion and document elaboration.
- Functions of search and knowledge management include full-text and attribute search, search by classifiers, tools for complex search queries organization, varied smart search technologies, document cataloguing and classification tools, creation of knowledge bases on different data domains, receipt of aggregated information (reports) etc.
- Functionalities extension capabilities play an important role in selection of a content management system. In the course of applications creation the standard tools of their adjustment as provided by the platform may turn insufficient. This also necessitates usage of program platform interfaces.

CM system can combine the best features of several classes of information systems. From systems for Business Process Management - Case Management takes the abilities to appoint tasks to individual employees, control of execution of commissions, management of business rules and reporting tools. From systems of Enterprise Content Management - ability to work with unstructured data, the possibility of a flexible classification and building hierarchies of such data, support of different versions, access control mechanisms and logging changes.

#### **4. Practices of case management implementation and market of case management systems**

Interest in Case Management has climbed higher and higher throughout 2009. According to Forrester Research "Dynamic Case Management — an Old Idea Catches New Fire" (Moore C., Craig Le Clair, Viti R., 2009)

CM Drivers include:

- An increased need to manage the costs and risks of servicing customer requests — like loans, claims, and benefits;
- A greater emphasis on automating and tracking inconsistent "incidents" that do not follow a well-defined process;
- New pressure on government agencies to respond to a higher number of citizen requests;
- New demands that regulators, auditors, and litigants place on businesses to respond to external regulations;

- The increased use of collaboration and social media to support unstructured business processes.

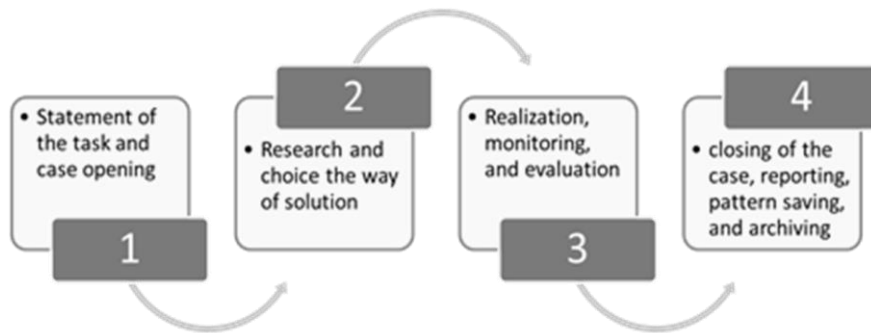
Today ACM actively used in the following areas:

- Complex services provision in health care, jurisprudence, finance, reporting and informational support, conduct of client affairs;
- Development of complex products and conducting marketing campaigns;
- Social sphere and social initiatives, etc.

The best practices of Case Management successful implementation are related to the health care and social sphere. One of the main goals of Case Management is to provide social services by the most effective way. National Association of Social Workers (USA) have been developed the Standards for Social Work Case Management (NASW, 2013). Thus, the case management - is a client support in solving its problems from the beginning to the end.

Business Process Management (BPM) and Enterprise Content Management (ECM) suites alone are insufficient for Dynamic Case Management, but the convergence of BPM, ECM, business analytics, and event processing will breathe new life into case management. Lean initiatives to improve business processes will also shine a spotlight on case management. These forces will push document-centric BPM suites toward packaged case management offerings (Moore C., Craig Le Clair, Vitti R., 2009).

As a rule, implementation of CM in organizations is carried out in the following four stages (Figure 2):



**Figure 2:** The main stages of case management implementation

In the Russian market there are now the most famous case-products of the following vendors: IBM: Adaptive Case Management; SAP: RCM; EMC Documentum: xCP; Open Text: Case Management Framework. Each of the vendors implements their understanding of the concept of the Case Management, taking into account the best features of its own platform (Table 1).

**Table 1:** The most famous case management systems in Russia (source: CNews Analytics, 2011)

Vendor	Soft - CMS	Distinctive characteristic
IBM	Adaptive Case Management	Completeness of Case Management functionality Industrial system integration of business rules management iLog
SAP	RCM	Integration of Case Management and Record Management in a single package Unlimited mutual nesting cases and records
EMC	xCP	Integration of the system mass input Captiva Integration with industrial systems of business process management
Open Text	Case Management Framework	Built-in ad-hoc workflow management system Integration with SAP ERP and SAP RCM - for example, the ability to establish a connection between the business-object and case

## 5. Conclusion

In today's highly competitive business environment, companies seek to increase their efficiency, and Case Management allows them to respond promptly to changes in business processes and information processing methods, to maintain control over each decision for the purpose of subsequent audit and analysis. The focus on supporting knowledge workers is significant and on the first place there is a need to support the process of reasonable and right decision making.

Case Management can be used for coordination of a number of different information technologies in order to provide a supporting environment for knowledge workers.

Adaptive Case Management can be considered as a tool for forming corporate knowledge; it is an approach to work that supports knowledge workers to achieve positive results, improving quality of client care and effectiveness increase of knowledge processes.

Organizations can successfully use Case Management for forming corporate knowledge by using features and capabilities of modern software. Case Management solution based on BPM technology provides the best way for supporting the appropriate capturing, gathering, sharing, and retrieval of knowledge for knowledge workers within a business processes.

Systems of Business Process Management and Enterprise Content Management with specific support for knowledge intensive processes can be discussed as the more appropriate solutions to Case Management. Moreover, Case Management System can combine the best features of several classes of information systems.

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