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Anti-patterns in knowledge management

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Anti-patterns in Knowledge Management

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Abstract: Particularly in multinational organisations, Knowledge Management initiatives often fail to deliver cost-effective solutions, support knowledge transfer mechanisms, and measure up to expectations. This paper identifies dysfunctional KM scenarios and formally describes necessary actions to resolve such issues by definition of the concept of KM anti-patterns. The work is aimed primarily at practitioners, i.e., managers and senior executives, in order to enable fast and effective problem identification and resolution, as well as cut costs for managing knowledge due to dysfunctional, inefficient or otherwise inappropriate KM practices.

Keywords: anti-patterns; dysfunctional scenarios; knowledge management; organisational practices.

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1. Introduction

An anti-pattern is a relatively new concept used for describing ineffective patterns or counter-productive practices. It was coined in 1995 by Koenig (Koenig, 1995) and more recently has been popularised in the fields of software development (Long, 2001) as well as social interaction (Laplante and Neill, 2006). The main advantage for organisations of identifying and analysing anti-patterns is that it allows managers to get a better understanding of current problems - or future issues – within the workplace, while giving them the opportunity to highlight any relevant causes and seek appropriate short and long term solutions.

Ambler (1998, p.5) argues that an anti-pattern is “the description of an approach to solving a common problem, an approach that in time proves to be wrong or highly ineffective”. Laplante and Neill (2006, p.5) describe anti-patterns as “situations that we often find ourselves in, [and which] are not healthy for the individual or the organization”. Furthermore, in the context of software design, Long (2001) sees anti-patterns as obvious, but incorrect solutions to recurring problems. In general, an anti-pattern is aimed primarily at practitioners (i.e., managers and senior executives) and therefore catchy memorable titles are used, such as ‘mushroom

management' and 'cash cow' among others, in order to enable fast and effective problem identification and resolution.

Given the above examples and reviewing the relevant literature, it is evident that the notion of anti-patterns has, up to now, been predominantly explored within the disciplines of programming and project management. To the best of our knowledge, discussions on identifying and resolving anti-patterns specific to Knowledge Management (KM) are neither reported nor investigated. Hence, in an attempt to address the existing gap, this paper defines the concept of 'KM anti-patterns' and develops a structural requirement that identifies dysfunctional situations and remedies while enabling executives to manage knowledge effectively within the business.

2. Defining 'KM anti-patterns'

Bhatt (2001, p.75) noted that "knowledge management is a comprehensive process of knowledge creation, knowledge validation, knowledge presentation, knowledge distribution, and knowledge application". However, in the broader KM literature, it has been noted that organisations typically face a number of roadblocks when implementing such processes, which can hinder the effectiveness of a corporate knowledge management effort (Fontain and Lesser, 2002; Malhotra, 2004). For example, failure to align knowledge management efforts with the organisation's strategic objectives and to clarify each person's responsibilities can turn the situation within departments into a disorganised and messy environment. Additionally, particularly in agile environments where flexibility and agility impact on knowledge sharing communities, resistance can occur due to the pace of change, potentially affecting the business's operations and functionalities (Israilidis and Jackson, 2012).

It can therefore be deduced that there are a plethora of cases in which KM initiatives fail to deliver cost-effective solutions, support knowledge transfer mechanisms, and measure up to expectations, possibly due to the lack of formally describing KM dysfunctions as well as identifying necessary actions to resolve such issues. The main idea evolved from the above analysis is the creation of anti-patterns for Knowledge Management to help organisations identify problems easily and cut costs for knowledge sharing due to dysfunctional, inefficient or otherwise inappropriate practices. Consequently, this concept has led to the creation of the term 'KM anti-pattern' and as no previous definition has been given to support this key term, we have provided our own based on our research and professional practice:

“KM anti-patterns are dysfunctional situations identified in Knowledge Management systems and practices, followed by the necessary modifications to resolve this dysfunction”.

Brown *et al.* (1998) proposed a comprehensive format for structuring anti-patterns which is similar to the structure of patterns, i.e. forming a vocabulary of communication. Thus anti-patterns have a unique and meaningful name, keywords (relating to the anti-pattern) as well as a short description of the problem and solution, using the anti-pattern. Based on the previous work carried out by Brown *et al.* (1998), Laplante and Neill (2006) adopted a similar approach in developing the structures of anti-patterns, but including less formal structure while concentrating on the identification of the dysfunctional situation. The proposed structure of a KM anti-pattern is influenced by the template proposed by Laplante and Neill (2006) but contains minor differences both in terms of wording (terminology) and number of characteristics used, due to the uniqueness of knowledge management as a management science. The proposed template of a KM anti-pattern is portrayed in Table I.

INSERT TABLE I ABOUT HERE

Similar to other anti-patterns, KM anti-patterns can either be isolated or related to other KM anti-patterns, through their causes, symptoms and countermeasures (namely, interacting KM anti-patterns). Studying the relationship between different KM anti-patterns can be beneficial for managers to trace the most relevant starting KM anti-pattern as well as the causes that brought them dysfunction. However, in the scope of this paper, KM anti-pattern interrelationships will not be further explored.

3. Clustering ‘KM anti-patterns’

In order to help managers efficiently locate the KM anti-patterns appropriate to their situation, we have created a list of ‘KM anti-pattern’ foci based on Bhatt’s (2001) work on the characteristics that knowledge management processes should have in order to be effective. We believe that these characteristics could capture the type of knowledge management problems within organisations, and help practitioners both identify and recognise common KM dysfunctions in their respective industries. Table II depicts the complete list of KM anti-pattern foci along with the common influencing factors of each KM anti-pattern.

INSERT TABLE II ABOUT HERE

The aforementioned KM anti-patterns have been identified and experienced by the authors in the course of their practical experience in multiple workplaces, and were originally formed on an objective basis to describe KM dysfunctional scenarios as noticed by employees and managers in large multinational organisations. They are purposively generic to ensure applicability across Defence and Aerospace, Enterprise Application Software, Information Security, Technology and Education sectors. Although the eight KM anti-patterns outlined in this paper are not meant to form an exhaustive list, they represent common issues that can hinder the effectiveness of a knowledge management effort, costing organisations time, resources, and perhaps, most importantly, reputational damage. As research in this area continues it is likely that new KM anti-patterns will be identified through interactions with practitioners and KM researchers. The above mentioned KM anti-patterns are extensively discussed in the following sections.

4. Knowledge Management Anti-patterns

This section introduces eight KM anti-patterns which could have resulted due to poor Knowledge Management practices or KM failures. Each of the following KM anti-patterns can be easily diagnosed by also looking at Table II, where all KM anti-patterns have been clustered in categories around the type of failure of KM projects.

4.1 Course-mongers

Name: Course-mongers

Description: Employees who attend irrelevant training or personal development courses.

Reason: This dysfunction is possibly caused due to the lack of incentives to work on new tasks, as well as the lack of motivation of certain employees to deal with unforeseen circumstances they may experience, particularly within technology intensive organisations. Specifically, in an attempt to gain their manager's support by showing involvement in such KM activities, or to avoid other work tasks, and without willingness to genuinely share and exchange knowledge amongst their co-workers, employees sign-up to attend irrelevant (to them) personal development programmes.

Dysfunction: There are multiple symptoms associated with this dysfunction. At an organisational level, there could be a lack of knowledge sharing and exchange between related business units leading to duplication of KM efforts (Israilidis and Jackson, 2012). If people are not willing to genuinely interact with other co-workers then avoidance

behaviours could develop in the workplace. As a result internal tensions could also be unnecessarily fostered. Finally, group discussions and decision-making are stifled, leaving less room for innovation and constructive new knowledge development.

Symptom Checker: Consider the following questions:

- Are there an unexpectedly large number of people in the organisation who want to sign up for training schemes?
- Have you noted any problematic or unhealthy behaviour among employees interacting in training sessions?
- Does the organisation provide out-of-date or inappropriate training schemes using dated or inefficient training methods?

If you answered 'yes' to one or more questions, the organisation is likely to promote course-mongers.

Action: In order to prevent the appearance of course-mongers, the organisation needs to establish both short and long term actions. First of all, practitioners should monitor the available training and personal development courses offered by the organisation and keep records of who attends what. This will allow for transparent and effective processes for knowledge management while making it difficult for staff members to get into this dysfunctional situation. Furthermore, long term actions could include the implementation of strategic steps towards developing higher quality and more relevant training courses. Specifically, mentoring schemes should be reviewed accordingly to provide a holistic and comprehensive training experience that will require employees to use the medium of training to disseminate their experiences and knowledge. Also, incentives and other recognition mechanisms should be used to increase productivity and motivation while improving the information flows in the business.

4.2 The Pluralists vs. the old guard

Name: The Pluralists vs. the old guard

Description: Conflict between generation Z (digital native employees) who demonstrate a strong commitment to social media and use mobile devices for working purposes, and those less comfortable with the pressure for change within corporate organisations.

Reason: Generation Z (or simply Gen Z) employees are not a cause of a faulty KM practice or an ineffective KM strategy. They are people born from 1989 onwards, and have a close connection to technology and social networking. Gen Z is the first generation considered to be native to high speed internet and the use of media technologies, including the World Wide Web, instant messaging and mobile devices among others.

Dysfunction: Gen Z is used to managing knowledge and sharing information at a rapid pace and on a variety of platforms. This generation

is reflective of a pluralistic society and has been brought up in an era of post-modernism, multiculturalism, and globalisation. Many corporate organisations however have not yet adapted to such working rhythms. In most cases, they are very gradual in adapting and introducing new technologies, and tend to ignore any shifts in employee attitudes and behaviour in the short term. Given the pace with which social networking has evolved, this can be the source of friction within organisations. As noted by Conley (2011), Gen Z is characterised by continuous partial attention to the working environment, and their ability to multi-task is often seen as negative. However, it is not only the attention to detail that is seen as negative; the friction caused by the different platforms of communication preferred by the different generations (i.e. Gen Z do not do email as well) and the temporary problems often associated with changes to company rules regarding the acceptable social platforms and collaborative tools (such as Skype, YouTube and Facebook) could unavoidably cause numerous dysfunctions within an organisation, particularly in relation to knowledge management and sharing practices. Moreover, the result of an aging workforce is one of the main reasons for knowledge and expertise loss in multinational organisations. Deloitte (2012) has highlighted that talent is one of the biggest challenges companies face in the coming years, particularly in technology intensive industries, such as the Aerospace and Defence industry, given their demographic composition.

“Today’s entry-level workers value open environments, rapid advancement, flexible work arrangements, diverse assignments, and non-hierarchical organizations. A&D companies have traditionally been characterized by the opposite: Facilities are at times old, utilitarian, and closed; access to information is tightly controlled, advancement can be slow and measured, hierarchies are clear and firm, and many people work a single program for 10 to more years” (Deloitte, 2012, p.17).

It is therefore clear that “the loss of corporate knowledge caused by retirements and layoffs is known as considerable impact on the industries” (Jafari *et al.*, 2007, p.376); hence organisations should address and alleviate the Gen Z issue in order to attain sustainability for their KM efforts.

Symptom Checker: Consider the following questions:

- Are requests for the use of new communication platforms routinely blocked by management?
- Is there an increasing pressure to review rules around acceptable social platforms or collaborative tools in the business?
- Is there employee resistance to using communication platforms beyond email and phone?
- Can you see an ‘on-demand’ culture in the organisation?

- Are employees eager to update their social or business status online or via text messaging while using new technologies, such as portable devices and mobile phones, more regularly than their desktop computer?

If you answered 'yes' to one or more questions, the organisation is likely to employ Gen Z people.

Action: Managers should address changing trends in industry “making themselves more attractive to the next generation, while retaining the core elements that have made them successful” (Deloitte, 2012, p.17). Particularly, actions for Gen Z could be expanded to include harnessing the opportunities offered by Gen Z employees, for example by involving them in designing social media strategies. *McKinsey's Social Economy* report (2012, p.4) notes that “organizations that fail to invest in understanding social technologies will be at greater risk of having their business models disrupted by social technologies [hence] transformational changes in organizational structures, processes, and practices, as well as a culture compatible with sharing and openness [are required]”. It is argued that creating open, non-hierarchical and knowledge-sharing cultures can contribute towards an effective KM effort. Furthermore, “shifting communications among interaction workers from channels designed for one-to-one communication (e.g. e-mail, phone calls) to social channels, which are optimized for many-to-many communication” (McKinsey Global Institute, 2012, p.10) could also assist this effort. However practitioners should understand that these IT and management innovations can take years to demonstrate their full potential, can disrupt traditional business models and carry multiple risks, including censorship, identity theft, abuse, and loss of intellectual property among others.

4.3 Knowledge Ma(nage)rmite

Name: Knowledge Ma(nage)rmite

Description: Employees who either intensely like or dislike Knowledge Management, i.e. they either love or hate mechanisms that support identifying, capturing, evaluating, retrieving, and sharing the information assets of the organisation.

Reason: The cause behind this KM anti-pattern lies mainly on the personal perception of each employee to perform effectively organisational tasks, such as knowledge sharing and innovation. Furthermore, employees who want to gain the acceptance of their superiors or to show they are closely connected to KM-related activities are likely to develop this KM dysfunction. Equally, employees who lack motivation and aspiration from managers and senior executives are likely to develop distant and remote working habits; hence may lose interest in harnessing KM and other knowledge-sharing practices.

Dysfunction: In cases of Knowledge Management, employees are either in the centre of the organisation's operations or left aside without being given enough support to deal with daily business issues. Both situations are unhealthy for the organisation and decrease the level of institutional knowledge within different business units. If managers are not able to provide a balanced environment, particularly in terms of communication and collaboration, employees will be reluctant to share their knowledge and skills, let alone generate new knowledge and innovate. Trust and honesty are likely to be broken affecting employees' decision-making and knowledge capabilities. Additionally, various challenging behaviours and internal tensions may appear leading to unstable knowledge exchange and acquiring mechanisms.

Symptom Checker: Consider the following questions:

- Are there employees who feel disenfranchised and unsupported by management to participate in KM activities?
- Do those who advocate KM within the organisation seem to have developed into a clique?
- Are employees unaware of the KM projects and performance improvement activities held in the organisation?

If you answered 'yes' to one or more questions, the organisation is likely to promote the issue of knowledge management.

Action: With regard to knowledge management, actions could include using Social Networking Analysis to gain better understanding of workplace interactions and collaboration. Cross *et al.* (2001, p.118-119) note that "understanding how knowledge flows (or more frequently does not flow) across these various boundaries within an organization can yield critical insight into where management should target efforts to promote collaboration that has a strategic payoff for the organization". Using this citation makes it clear and easier to understand the dynamics of today's social networks which can increase importance to effectiveness of business processes. A further action could be to use targeted interventions, such as the use of cross-functional (and cross-level) teams, and team-building activities, to increase collaboration and communication in the organisation. This approach is possibly more costly in the short run, however can be cost-effective in the long run.

4.4 Headless Chicken

Name: Headless Chicken

Description: A situation where KM systems are developed and introduced without management support or direction.

Reason: It is often observed that the majority of KM systems are usually designed and implemented without first carrying out extensive stakeholder consultation. Particularly in large organisations, the infrastructure to

support executive or senior management buy-in is not provided or is often seen as a non-formalised process. It is therefore common to encounter situations where KM systems are developed and introduced without management support or direction, leading to inadequate technical, human, procedural or financial resources being allocated to continuous improvement activities and other system-related skills training.

Dysfunction: Headless Chickens could result in multiple dysfunctional situations for both managers and employees in the organisation. In the presence of inappropriate, insufficient or unsupported functionality, KM systems could lead to incorrect decision-making and ineffective work practices. In addition to the above implications, it is also important to maintain leadership and managerial direction in order to facilitate knowledge sharing and enhance networking. Specifically, the poor communication strategy between management and the employees could cause a chaotic knowledge exchange environment across departments, and the lack of management support for KM activities and tools can often make employees feel that feeding into KM activities is not part of their job (Israilidis and Jackson, 2012). Several advantages derived from the existence of collaborative networks, namely engaging communities in conversation, recruiting skilful employees, developing new innovative ideas, offering product, marketing and contact information, gaining project support and brainstorming with others on how best to complete a project (Moore and Neely, 2011), may not be fully explored and tacit knowledge may not be circulated effectively across the organisation. This in itself could reduce the creation and promotion of new knowledge which is essential for the company's competitiveness (Leonard and Sensiper, 1998).

Symptom Checker: Consider the following questions:

- Do KM systems lack active management support and involvement?
- Are there platforms in use for KM which are not formally recognised by management?
- Is there a lack of appropriate tools to support bottom-up communications?
- Do managers neglect the importance of Knowledge Management in facilitating knowledge sharing and learning?
- Do employees feel unsupported in taking time from their working schedules to engage in KM activities?

If you answered 'yes' to one or more questions, the organisation is likely to promote the issue of Headless Chicken.

Action: Where KM systems have been developed and successfully adopted by employees they should be embedded within business strategy and outlined in relevant organisational documentation, such as induction and training materials. Further actions include, but are not limited to,

engaging employees in developing good practice to help solve business challenges, establishing a clear connection to corporate strategy and supporting an agreed way of working.

4.5 Larry the Leach

Name: Larry the Leach

Description: Someone with knowledge who is loathe to share it with others, preferring to be in a situation of supreme power on a given topic. Leaches therefore approach KM in terms of what they can get and not what they can give.

Reason: The cause behind this KM anti-pattern lies mainly on the perception of Francis Bacon's famous dictum that "knowledge is power" (Bacon, 2000) rather than "knowledge sharing is power". Particularly in knowledge intensive environments, employees often see knowledge as a personal rather than a collective possession. Knowledge is also viewed as a form of job security and power, making employees less willing to share tacit knowledge with co-workers (Davenport and Prusak, 1998). Moreover, inappropriate reward mechanisms could also influence knowledge sharing behaviours within high technology companies promoting the KM dysfunction of leaches with little motivation to share new knowledge and expertise.

Dysfunction: Undoubtedly, one of the many downsides of this KM anti-pattern is that leaches are a single point of failure for organisational processes, i.e. no back-up (redundancy) exists to ensure the continuity of operations and availability of critical resources. In management, a potential single point of failure is highly undesirable in order to maintain high performance and increase reliability (Lynch, 2009). However, it is affirmed that such design structures often create knowledge silos as well as bottlenecks, which in most cases act as barriers to knowledge sharing, leading to dysfunction and failure across multiple organisational levels. Furthermore, this KM anti-pattern is also related to poor relationship management between internal teams and external partners, preventing the intensification of social capital and making the organisation vulnerable to threats that jeopardise the growth and quality of important knowledge.

Symptom Checker: Consider the following questions:

- Are employees seeking to avoid knowledge sharing and exchange events?
- Have you noticed a high number of ignorant and unaware employees in the organisation?
- Is knowledge parochial and sticky in some environments?
- Have you noticed limited collaboration or communication activity?

If you answered 'yes' to one or more questions, the organisation is likely to promote the issue of Larry the Leach.

Action: A necessary prerequisite to promote knowledge sharing and transmission processes in the organisation is to incentivise employees with attractive rewards or other recognition mechanisms that meet the different motivations of each knowledge worker involved in KM processes. Moreover, particularly within knowledge intensive organisations, the social climate may encourage, or indeed discourage, employees to interact with others as they do their job (Ashkanasy *et al.*, 2000). Hence, promoting a social climate which facilitates knowledge exchange and collaboration can be regarded as critically important. Finally, engaging employees in a process of knowledge exchange and combination by providing opportunities to combine and share knowledge within the organisation (Nahapiet and Ghoshal, 1998), could increase the performance of decision-making processes and promote new knowledge and innovation.

4.6 Dead Parrot

Name: Dead Parrot

Description: Failed KM systems which stagger on cluttering the KM landscape whilst adding little to productivity or knowledge in general.

Reason: The extant literature has discussed various reasons associated with the failure of KM tools and applications in the workplace. According to Malhotra (2004), knowledge management systems fail because of two broad reasons:

“First, knowledge management systems are often defined in terms of inputs (such as data, information technology, best practices and so on) that alone may be inadequate for effective business performance. [...] Second, the efficacy of inputs and how they are strategically deployed are important issues often left unquestioned as ‘expected’ performance outcomes are achieved” (Malhotra, 2004, p.99).

It is therefore clear that knowledge management systems can easily fail to support organisational evolving needs, if intervening and moderating variables, such as attention, motivation, commitment, creativity, and innovation, are not accounted for in the business model design (Malhotra, 2004). Furthermore, the design and development of KM systems should not be driven by the value of specific, pre-defined performance outcomes as they may easily erode by the dynamic shifts in the business and competitive environments (Malhotra, 2004); hence, add little to productivity or knowledge in general.

Dysfunction: Dead Parrots could generally hinder the effectiveness of a knowledge management effort, costing organisations time, money and resources. Specifically, this KM anti-pattern shares similar dysfunctions with the issue of Headless Chickens, in terms of incorrect decision-making

and ineffective work practices. Furthermore, failed KM systems can often be unproductive and unsuccessful in both accomplishing business goals and improving operating efficiency; thus they may stagger on cluttering the KM landscape, whilst leading to ineffective business practices and unsatisfactory work performance.

Symptom Checker: Consider the following questions:

- Are there KM systems in use which have either historically had high volumes of usage and now do not, or new KM systems which have not flourished since introduction?
- Are employees nescient or uninformed about given KM tools or applications in the business?
- Do any KM systems contain unnecessarily out-of-date information or appear otherwise antiquated?
- Do employees seek out alternative tools and applications that could help them do their job and manage their knowledge more effectively?

If you answered 'yes' to one or more questions, the organisation is likely to promote the issue of Dead Parrots.

Action: The key action here is to know when to either, 'pull the plug' on a given KM system, or divert new resources into maintaining and improving the system, and re-invigorating the user base to utilise it. Additionally, conducting an extensive knowledge audit could also be beneficial in order to reveal unanticipated knowledge needs as well as identify if any former, unexplored, KM systems could be used to improve the areas of knowledge gaps identified in the organisation. Finally, a rolling policy of review and replacement could also prove useful, if successfully implemented by the organisation.

4.7 PUP – Poor Unsuccessful Programmes

Name: PUP – Poor Unsuccessful Programmes

Description: A poorly architected, designed or developed software application (or tool) that employees are mandated to use because it is embedded within an organisation's process and rules, even though better applications may exist for the same task.

Reason: Knowledge Management systems are often developed for political and economic reasons which in retrospect prove unwise. The funding for KM systems may well be sourced from outside the department that the system is intended to help, and the needs of the user base may not feature highly when the system is designed or customised for use. Such issues can be exacerbated by poorly supported outsourcing of system development to third parties. One example of this that the authors have noted on multiple occasions relates to the adoption of Microsoft SharePoint by organisations without taking the time to redesign

organisational processes to take full advantage of it. This situation could lead to the creation of systems with inadvisable user requirements and inappropriate interfaces; therefore they may inevitably fail to support basic knowledge management processes, including knowledge sharing, transmission, and acquisition, among others.

Dysfunction: Poor Unsuccessful Programmes could serve limited or inappropriate functionalities leading to multiple organisational anomalies, such as inefficient work practices, cognitive stress, lack of perspective, incorrect decision-making and de-motivation, with effects both on individuals and decision processes. In addition, the aforementioned anomalies could cause physical, psychological, social or emotional distress to employees, which in turn may inevitably lead to knowledge confusion and management failure. It is also worth noting that such anomalies may dishearten people from involvement in KM making them loathe to share tacit knowledge with others.

Symptom Checker: Consider the following questions:

- Are the KM tools or systems in the organisation designed and developed by outsourcing partners?
- Do employees express concerns about the quality, practicality, and usability of specific programmes or applications in the organisation?
- Does the organisation promote the use of specific programmes as corporate standards, even though more appropriate applications may exist for the same task?
- Is maintenance and troubleshooting of KM systems and applications regarded as a secondary consideration to system designers?

If you answered 'yes' to one or more questions, the organisation is likely to promote the use of Poor Unsuccessful Programmes – PUP.

Action: The action for this KM anti-pattern should focus not only on preventing Poor Unsuccessful Programmes from being used within the organisation but also knowing when to stop or re-scope KM developments exhibiting these characteristics. This can be achieved through a rigorous monitoring scheme during the design and implementation phases in order to carefully assess different user requirements while taking into account existing corporate practices and structures. Moreover, continuous feedback on the systems' functionalities and features should be recorded to enable the fast resolution of any technical or operational issues that might arise. Failure to do so could, once deployed, quickly lead to Dead Parrot anti-pattern.

4.8 Multi(ap)plications

Name: Multi(ap)plications

Description: The existence of a plethora of overlapping applications used for the same tasks, which may often clash with one another causing confusion and tension to employees.

Reason: Multiple applications used for the same or similar tasks are often found in large organisations, plausibly due to the tendency of organisations to create and develop new applications from scratch rather than improving and tailoring software programmes that are already available in the corporate system portfolio, perhaps within related siloed departments. Also, in a number of organisations, individual employees may be given the flexibility and time to design and create new tools in order to improve best practice and increase performance; however, it is often the case that this process is done without prior consultation or research as to whether similar systems are in place (often due to a lack of visibility between departments). Additionally, if two or more systems happen to be in place, there is often no process or strategy responsible for ensuring which system to preserve and which to replace, as it is often left to the employees to decide what is best and more convenient for them to use. Although such competitions can be a valuable technique to find the best tool, unless intentional it instead appears to the employees to be the result of mismanagement.

Dysfunction: Multiple applications could lead to functionally driven KM documentation and processes, which is one of the main causes of inefficiency in the overall operations of the business (de Bruin and Doebeli, 2008). In general, it is claimed that processes should be process driven in order to enable easier and faster access to knowledge sources that move across many functions in an organisation. This however is more clearly illustrated through the use of a case-study scenario as follows. In Product Safety for example, documents are seen as an engineering activity, therefore people in Procurement would never consider accessing them, despite the fact that everybody has a part to play in this area. Hence, by streamlining access to information across different domains, knowledge becomes more accessible and all the necessary information is picked up effectively and efficiently.

Symptom Checker: Consider the following questions:

- Is there more than one application in place for the same job, and if so do people know why?
- Are employees confused by which application to use when asked to carry out a task?
- Is information stored in multiple medium making it difficult for employees to easily access and process data?
- Are employees keen to develop additional applications despite the fact that there are already similar applications in place?

If you answered 'yes' to one or more questions, the organisation is likely to promote the issue of multi(ap)plications.

Action: Considering the multiplicity of over-lapping systems, practitioners could conduct an extensive systems analysis to ascertain end-user requirements, identify technical dysfunctions, as well as determine whether current KM systems are economically and technologically sound. Additional actions to improve performance and manage knowledge more effectively could include the removal of unwanted or unused applications, and the conduct of regular meetings between developers from different business units in order to avoid duplication and overlapping functionality.

5. Discussion

Exploring KM anti-patterns enables practitioners to formally identify and resolve KM dysfunctions as well as cut costs for managing knowledge due to malfunctioning mechanisms. Our analysis covers a wide spectrum of KM dysfunctional situations where both managers and employees are involved in multiple knowledge management activities such as knowledge creation, validation, presentation, distribution and application processes. To the best of our knowledge, this paper is a first attempt to detect, analyse and categorise KM dysfunctional situations using a systematic KM anti-pattern template. We also argue that the issues addressed in this study could lead to ineffective practices and management failures; therefore it is important, particularly for managers and senior executives, to acknowledge, verify and act upon such matters in order to avoid tensions and increase performance within their business.

As noted in the introduction, anti-patterns should be memorable, allowing practitioners to easily identify and analyse their associated dysfunction. With this in mind, all the aforementioned KM anti-patterns have a unique name providing a clear and accurate description of their profile. Furthermore, each individual KM anti-pattern describes the causes, symptoms and problems as noticed by employees and managers in large multinational organisations in order to provide a holistic picture of each dysfunctional situation. In addition to the above, it is important to note both the short and long term actions required to counteract each KM anti-pattern, with particular attention to managing knowledge more effectively as well as gaining competitive advantage, by providing opportunities to combine and share knowledge within the organisation.

Finally, we argue that a simple checklist could also be beneficial in order to help managers, and practitioners in general, diagnose whether they suffer from a particular KM anti-pattern. Hence, a symptom checker is included with each KM anti-pattern, and advice is provided based on answers to the questions listed.

6. Concluding remarks

After conducting a thorough analysis on the role of anti-patterns in the fields of software development and social interaction, this paper creates, defines and explores the concept of anti-patterns for KM in order to help organisations identify problems efficiently, and cut costs for knowledge sharing due to malfunctioning mechanisms. In addition, it proposes a comprehensive format for structuring KM anti-patterns based on characteristics that knowledge management processes should have in order to be effective. This study identifies and analyses eight KM anti-patterns which have resulted from poor Knowledge Management practices or KM failures across multiple industries and functional disciplines. Each KM anti-pattern is clustered into categories around the type of failure of KM projects, enabling practitioners to easily diagnose common KM dysfunctions in their respective industries. Finally, to the best of our knowledge, the listed KM anti-patterns in this paper are the first and only attempt made in the literature, thus future work is highly recommended both to identify new KM anti-patterns, and in order to explore KM anti-pattern interrelationships.

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Table I: The KM anti-pattern template

<i>Name</i>	A unique and meaningful name describing the KM anti-pattern accurately.
<i>Description</i>	A short description of the KM anti-pattern including some keywords, if appropriate.
<i>Reason</i>	The causes that may lead to the KM anti-pattern.
<i>Dysfunction</i>	The symptoms and problems noticed by knowledge workers and managers.
<i>Symptom checker</i>	A small checklist to help managers diagnose if they suffer from the particular KM anti-pattern.
<i>Action</i>	The short and long term actions required to counteract the KM anti-pattern.

Table II: KM anti-pattern clusters

	Knowledge creation	Knowledge validation	Knowledge presentation	Knowledge distribution	Knowledge application
<i>Course-mongers</i>	✓			✓	
<i>The Pluralists vs. the old guard</i>			✓	✓	✓
<i>Knowledge Ma(nage)rmite</i>	✓			✓	
<i>Headless Chicken</i>		✓	✓	✓	✓
<i>Larry the Leach</i>	✓	✓		✓	
<i>Dead Parrot</i>	✓		✓		✓
<i>PUP – Poor Unsuccessful Programmes</i>			✓	✓	✓
<i>Multi(ap)plications</i>		✓			✓