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ASPECTS OF MODERN IT PROJECT AND TEAM MANAGEMENT – RELEVANT BASIS FOR THE FORENSICS INVESTIGATORS

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To conduct high-quality forensic examinations in the field of IT, forensic experts need a solid understanding of IT project management basics. Such projects offer ample opportunities for malicious actors to manipulate money flows, engage in money laundering, and commit other financial crimes. Additionally, modern approaches to team management introduce several information security risks.

Contemporary project and team management has its roots in the Industrial Revolution and has evolved significantly over the centuries. As technology advanced, it required increasingly higher levels of worker education for efficient operation. This led to a trend where a substantial portion of business value resides in the knowledge of its workers, making employee attraction and retention paramount.

Workers in the IT sector exemplify this trend well; the vast majority of value in the IT industry lies in the knowledge and problem-solving abilities of employees. Consequently, HR, project, and team management in the IT industry are in constant flux, evolving and often at the forefront of team and project management practices.

Initially, the IT industry adopted project and team management practices from the construction and architecture industries. There is indeed some similarity between these domains, so this approach made sense. This resulted in the first widespread project methodology known as Waterfall. The idea was to meticulously plan the project, down to fine details, including

timelines, dependencies, budgets, and more [1]. Afterward, a sign-off was obtained from all stakeholders, and the implementation phase began.

Some benefits of the Waterfall method included significant effort in risk discovery and management, early identification of project bottlenecks, and providing clients with predictability, as both the execution time and budget were strictly defined from the outset.

However, the Waterfall model had significant drawbacks, primarily its rigidity. Once the plan was signed off, making any major adjustments during the implementation phase was extremely costly at best and impossible at worst. It required a complete redesign of part of the plan, new timelines, budgets, sign-offs, and more. This inflexibility posed a problem, especially with IT projects often involving innovative elements never built in that specific form before [2]. The best way to discover the optimal shape of the final product was often through iterative use and feedback. This issue exacerbated even more whenever an external economic uncertainty would arise [3].

Empirical evidence showed that obtaining early and frequent feedback was the most reliable way to develop the best version of the initial idea and to build something the customer truly needed, not just what they thought they wanted. It is commonly observed, especially among UX (user experience) designers, that customers rarely know what they really want. Therefore, the project team's goal is to uncover the optimal shape of the product, creating something the customer could not have imagined on their own.

As the industry matured and gained more experience, it became evident that the Waterfall model's shortcomings were limiting the true potential of software development, particularly its inherent flexibility. Unlike construction, where building even a rough prototype is costly and impractical on a real scale, IT projects can create prototypes that closely resemble the final product in both appearance and behavior.

This unique capability allowed for a novel way of interacting with customers: involving them early and often. Eventually, a critical mass of experienced software developers led to the creation of the Agile Manifesto and the Agile project management methodology [4]. The core idea of Agile is to prioritize customer interactions and rapid experimentation over exhaustive project planning.

Since its inception, Agile has evolved significantly, yet it remains the most popular project management approach in software development. Agile suggests splitting the entire project execution into short time-frames called sprints [5], and planning and executing one sprint at a time. Nowadays, a typical sprint lasts two weeks, though some teams opt for up to four-week sprints, depending on the specific nature of the software they are building.

At the beginning of a sprint, the team gathers for sprint planning to discuss the most important and impactful tasks to accomplish during the sprint. At the end of the sprint, there is a retrospective and a demo. The retrospective allows the team to reflect on the sprint, celebrate achievements, discuss any issues, and consider how to mitigate these going forward. The customer demo provides an opportunity to show what has been built to the customer and obtain their early feedback.

This approach to project management allows Agile teams to acquire crucial information early in the project. If a particular aspect of the software, after being tested, is not as satisfactory as it seemed on paper, the team can adjust or change it in the very next sprint without extensive bureaucratic hurdles. Combined with the practice of continuous self-improvement through retrospectives, managing projects and teams in an Agile manner results in highly adaptable teams capable of delivering products that customers are genuinely happy to use.

Agile, with its fluidity and adaptability to customer needs, introduces certain challenges inherent to its nature. By definition, a product developed using the Agile approach does not have a fixed shape at the beginning. This uncertainty makes it difficult to determine early on how much time the implementation will take and what budget will be required. While some initial estimates are usually set, the product's shape evolves with each sprint and customer feedback, leading to potentially unpredictable additional work. This flexibility can be exploited by malicious actors to hide significant costs within the project, often without the customer's knowledge. Since most changes are approved during demo and feedback sessions, it can appear that all adjustments were customer-approved, at least de jure.

Another aspect of the Agile approach concerns team dynamics and information-sharing practices. In Agile projects, it is typical to involve the entire team in most activities. From planning to retrospectives and brainstorming sessions where solutions for current problems are discussed, the whole team is usually present, not just the individuals who will implement a specific part. This inclusive dynamic is highly effective, especially when the team comprises educated knowledge workers, but it necessitates extensive information sharing. Agile teams typically allow everyone access to all relevant information, making information security a challenging task and information fragmentation practically impossible. In such an environment, requests for data access are common and usually granted. Consequently, even developers in lower-level roles may have broad access to project information, which must be considered during forensic investigations.

In this article, we discuss the necessity for forensic experts to understand the basics of IT project management to conduct high-quality forensic

examinations in the IT field. IT projects present opportunities for malicious actors to manipulate financial flows and engage in crimes like money laundering. Modern team management approaches also introduce several information security risks. This interweaves forensics with the business and STEM knowledge, similar to how some other humanitarian topics are becoming more and more connected to mathematics in the modern era, taking the humanitarian aspects of the issues of finding distances between skew lines for example [6].

Initially, IT adopted management practices from construction and architecture, resulting in the widespread use of the Waterfall methodology. Waterfall's meticulous planning offered benefits like risk management and predictability but was rigid and costly to change mid-project. This rigidity was problematic for innovative IT projects, which benefited more from iterative use and feedback to shape the final product.

Recognizing Waterfall's limitations, the industry shifted to Agile, which emphasizes customer interaction and rapid experimentation over exhaustive planning. Agile, now the most popular project management approach in software development, divides projects into short sprints, typically lasting two to four weeks. Teams plan each sprint, reflecting on achievements and issues, and demonstrate progress to customers for feedback.

Agile's adaptability allows teams to make quick adjustments based on customer feedback, fostering highly adaptable teams capable of delivering products that genuinely meet customer needs. However, Agile's flexibility also introduces challenges, such as difficulty in early time and budget estimation. This can be exploited by malicious actors to hide costs, often without customer awareness. Additionally, Agile's team dynamics require extensive information sharing, complicating information security and making it necessary to consider the broad access levels of team members during forensic investigations.

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ОСОБЛИВОСТІ ПРОВЕДЕННЯ СУДОВОЇ ЕКСПЕРТИЗИ БЕЗПЕКИ ЖИТТЄДІЯЛЬНОСТІ, ЗА УМОВИ ЯКЩО ПОТЕРПІЛИЙ ПРАЦЮВАВ ЗА ЦИВІЛЬНО-ПРАВОВИМ ДОГОВОРОМ

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Експертиза в галузі безпеки життєдіяльності та охорони праці (у подальшому – експертиза в галузі БЖД та ОП) призначається, перш за все, для встановлення механізму здійснення потенційно небезпечного фактору, причин настання нещасного випадку, а також для визначення вимог нормативно-технічних документів, невиконання яких перебуває у причинному зв`язку з нещасним випадком.

Як різновид судових інженерно-технічних експертиз даний вид експертизи – це процесуальна дія, яка складається з проведення досліджень та надання висновку експертом з питань, рішення яких потребує спеціальних знань.

Безпека життєдіяльності – комплексна система знань про захищеність життя і діяльності особистості, суспільства і життєвого середовища від небезпечних факторів природного і штучного характеру. Безпека життєдіяльності поєднує в собі пожежну безпеку, санітарно-епідеміологічне благополуччя, охорону здоров'я, екологічну та ядерну безпеку, попередження надзвичайних ситуацій, цивільний