General Introduction

1. **Introduction :**

This section will be describing the project’s environment and working methodology. We will start by presenting the host company, then give an overview of the project itself, and finish by the working methodology.

1. **Host Company:**
   1. Overview :

Vistaprint is a multinational company, a part of Cimpress Group. It is located in 15 different countries including Tunisia. It provides printed and promotional customizable materials and marketing services to small businesses and consumers.

Starting as a simple paper provider, Vistaprint has become a leader in the e-commerce field. It exposes its items and services through the website “Vistaprint.com”. Its main products are business cards, Postcards, Websites, T-shirts, Hats, Pens, Sticky notes, Window Decals and car door magnets.

Beyond its printing business activities, Vistaprint is a technology-focused company. The fact that its e-commerce platform operates in a large scale and provides mass customization of products, leads Vistaprint’s technology managers to think a lot about complexity in resolving problems. This is why Vistaprint is highly dependent on Software engineering skills.

* 1. History :

Created by Robert Keane in Paris, Vistaprint began with providing small businesses with graphic design and desktop printing supplies via direct mailed catalogues.

By 1998, the company had begun to grow up into an internet e-commerce company by starting to create its own e-commerce platform. It was the year of the first expansion beyond France. The company reached the British and German Markets via the acquisition of “PaperDirect Europe” which, like Vistaprint at the time, was a specialty catalogue of desktop publishing papers.

Since 1999, it stated to deliver its products via the internet while focusing on its starting business and the first US office was opened in Framingham, Massachusetts.

2000 was the worst year for the company. Vistaprint lost its venture capital financing from Geocapital Partners after that investor reads a Wall Street Journal article questioning the viability of Internet based business models. Moreover, in order to survive the burst of the “dot-com crash”, the company was forced to sell off some pieces of the business and to reduce the workforce by 50 (from 70 to 20 employees). Vistaprint survived this crisis and emerged as a profitable company in 2002.

Three years later, Vistaprint was floated on the NASDAQ stock exchange. Since that time, the company’s revenue had grown up while continuing the expansion towards global markets in Europe, Japan and Australia. Today, its revenue exceeds the one billion USD declaring it as a large company. In addition to that, Vistaprint has enlarged its business to surpass the business card printing, offering as a consequence hundreds of options and marketing solutions for small businesses: including dozens of printed products, apparel, signage, email marketing, websites and internet marketing.

Vistaprint has served over 15 million customers in 120 countries, and received an average of more than 18,000 orders per day. And during last year, the company has been adding about 200,000 new customers to its client base each month and counts actually 4,100 employees.

In the beginning of 2014, the revenue of Vistaprint was 370,8 million dollars and announced an agreement to acquire “people & Print” Group, a leading German printing company specialized in “upload & print”.

After the several acquisitions of many companies like the leading Norwegian consumer photo product company “FotoKnudsen” and the leading web-to-print company Pixartprinting, Vistaprint changed its name to Cimpress in November 2014.

* 1. Organization :
     1. Capabilities :

It’s the organization that delivers capabilities to the company. In fact, we mean by the word capability, the combination of people, process and technology to produce a successful new project or initiative. This organization includes 5 areas:

* *Capability Development:* the software development organization.
* *Capability Operations:* the group that builds technology infrastructure and manages the world-wide technology operations.
* *Capability Support:* the team that builds technology infrastructure, manages technology operations, and delivers internal tools.
* *Capabilities planning:* this team facilitates planning within Capabilities and across the company partners.
* *Fulfill Demand:* this team is devoted to fulfillment software.
  + 1. Manufacturing and Supply Chain :

It’s responsible and accountable for the development, implementation and results of the company’s manufacturing strategy.

* + 1. CEO :

This organization includes the executive officers of the company and it is composed of members of the management team.

* + 1. Finance :

Finance is the pillar in charge of all financial transactions and budgeting for the company.

* + 1. Human Resources :

They ensure that Vistaprint finds, hires, rewards, develops and retains great team members. They do this by executing on a global HR vision with audacious goals and a strategic map.

* + 1. Legal :

Legal is the team responsible of enabling and supporting the achievement of Vistaprint’s ongoing business objectives and corporate responsibilities by providing the highest quality, creative legal services to the organization in a productive, solution-oriented and cost-efficient manner.

* + 1. Design Sales and services :

It comprises the process of serving Vistaprint customers across the globe by listening and advocating on their behalf, as well as delivering services they value.

* + 1. Marketing :

They are the one responsible for communicating the value of a product or service to the customer. Their main mission is to provide the plans, tools and tips to take the business to the next level.

1. **Problematic :**

Continuous Integration (CI) is a software engineering practice in which code changes are immediately built, tested and reported on once they are committed to the unified code base. The main idea behind this concept is to rapidly detect, identify and correct any potential defect brought on by the code change. CI detects deficiencies early on in development, therefore defects are typically smaller, less complex and easier to resolve. Nowadays its principles are widely applied within most programming models. Vistaprint is most certainly not missing out on this best practice, using Jenkins CI as their CI tool.

Jenkins is an application that monitors executions of repeated jobs, such as building and testing software projects. In fact, Vistaprint makes use of this tool to run different tasks, among which we find the unit testing. Unit testing is also a programming best practice. Simply put, it consists in a software testing method by which individual units of source code are asserted.

In our case, we are using Nunit. Nunit is a unit-testing framework for all .Net languages. Combining both Jenkins and Nunit is utterly possible. In fact, Jenkins is configured to fully support any unit test framework’s execution. However, being Java software itself, Jenkins is naturally better off handling Java based frameworks, most significantly in terms of Reporting and Data Analysis.

Every time a Nunit test is executed by Jenkins, an XML result file is generated. It is then overwritten by the next XML result file generated by the next Nunit test. This is due to the inability of Jenkins to manage and save different Nunit result files at the same time. This means that at any given time, we can have access to only the last generated XML result file. Very useful data may thus be lost, and therefore we would have no overview over the whole testing process.

1. **Solution :**

As a countermeasure to this unwanted behavior, test results data needs to be extracted and saved before Jenkins has the chance to overwrite the xml result files.

Simply put, when a Jenkins Job finishes executing a Nunit test (within a build), it triggers another Job that calls one of the two tools we created, and asks them to go fetch the test results data from the finished job. The two tools are a Jenkins plugin that works internally, and a Restful web service that exposes a PUT method, only providing the finished job’s URL.

Not only do these tools extract data out of xml files, but they also gather every available data concerning the build itself. This way we have a more global view over build/test statistics.

We then store the data in a centralized database that fuels a QlikView dashboard we also created.

1. **Working Methodology :**

Software development needs a working methodology that guarantees control and clear visibility throughout the development cycle, in a short time and a cost-efficient manner.

Vistaprint opts for a much known agile method: Scrum. So what is agile methodology and what is Scrum?

* 1. Agile methodology :

Agile methodology is an alternative to traditional project management, typically used in software development. It helps teams respond to unpredictability through incremental, iterative work cadences, known as sprints.

* 1. Scrum :
     1. Scrum Definition :

Scrum is the most popular way of introducing Agility due to its simplicity and flexibility. Scrum emphasizes empirical feedback, team self-management, and striving to build properly tested product increments with short iterations.

Scrum consists of Scrum Teams and their associated roles, events, artifacts and rules. Each component serves a specific purpose and is crucial to Scrum’s success and usage.

* + 1. Scrum Roles :

Scrum has only three roles: Product owner, Team and Scrum master.

* + - 1. Product Owner :

The Product Owner is responsible for maximizing the value of the product and the work of the Development team. They are the sole person responsible for managing the product Backlog. They are one person, not a committee. For the Product Owner to succeed, the entire organization must respect their decisions.

* + - 1. Development Team :

The Development team consists of professionals who do the work of delivering a potentially releasable Increment of the product at the end of each Sprint. They are empowered by the organization to organize and manage their own work. The resulting synergy optimizes the overall efficiency and effectiveness.

* + - 1. Scrum Master :

The Scrum Master is responsible for ensuring Scrum is understood and enacted. This is done by ensuring that the team adheres to Scrum theories, practices and rules. They are a servant-leader for the team. They help those outside the Scrum Team understand which of their interactions with the team are helpful and which are not. They thus try to maximize the value created by the Scrum Team.

* + 1. Scrum Events :

All events are time-boxed, such that every event has a maximum duration. Once a sprint begins, its duration cannot be shortened or lengthened. The other events may end whenever their purpose is achieved, without allowing waste in the process. These events are specifically designed to enable critical transparency and inspection.

* + - 1. Sprint :

Many thinkers say “Sprints are the heart of Scrum”. A sprint is a time-box of one month or less, during which a useable and potentially releasable product element Increment is created.

Sprints consist of the Sprint Planning, Daily Scrums, development work, Sprint review, and the Sprint retrospective.

* + - 1. Sprint Planning :

The work to be performed in the Sprint is planned at the Sprint Planning. The plan is created by the collaborative work of the entire Development team.

* + - 1. Daily Scrum :

The Daily Scrum is a 15-minute event for the Development Team to synchronize activities and create a plan for the next 24 hours. This is done by inspecting the work since the previous Daily Scrum and forecasting the work that could be done before the next one.

* + - 1. Sprint Review :

A sprint review is held at the end of the Sprint to inspect the Increment and adapt the Product Backlog if needed. This is an informal meeting and the representation of the Increment is intended to elicit feedback and foster collaboration.

* + - 1. Sprint retrospective :

The Sprint Retrospective is an opportunity for the Scrum Team to inspect itself and create a plan for improvements to be enacted during the next Sprint. It occurs after the Sprint Review and prior to the next Sprint Planning.

* + 1. Scrum Artifacts :

The artifacts represent work or value to provide transparency and opportunities for inspection and adaptation.

* + - 1. Product Backlog :

It is an ordered list of all features, functions, requirements, enhancements, and fixes that constitute the changes to be made to the product in future releases and is the single source of requirements for any changes to be made to the product. The Product Owner is responsible for the Product Backlog, including its content, availability and ordering. It evolves as the product and the environment in which it will be used evolves. The backlog is dynamic and constantly changing.

* + - 1. Sprint Backlog :

The Sprint Backlog is the set of Product Backlog items selected for the Sprint, plus a plan for delivering the product Increment and realizing the Sprint goal. It is a forecast by the Development Team about what functionality will be in the next Increment.

* + - 1. Increment :

The Increment is the sum of all the Product Backlog items completed during a Sprint and the value of the increments of all previous Sprints. At the end of the Sprint, the new Increment must be in a useable condition and meet the team’s definition of “Done”.

1. **Conclusion :**

We are now more comfortable with the different concepts that constitute the project’s environment, the problem this project mainly addresses, and finally the brief description the solution it provides. In the next chapter we will be discussing a theoretical study about the project’s domain.