## 

**HACETTEPE UNIVERSITY**

**ENGINEERING FACULTY**

**DEPARTMENT OF COMPUTER ENGINEERING**

**BBM 325**

**INTERNSHIP REPORT**

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**30**

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**TABLE OF CONTENTS**

[**1 Introduction**](#_le8rusnetffv) **3**

[**2 Company Information**](#_oj9vt0owaaae) **3**

[2.1 About the company](#_qz3tr64t1du4) 3

[2.2 About your department](#_o3sagc252mym) 3

[2.3 About the hardware and software systems](#_76vp60z8s134) 3

[**3 Work Done**](#_qducuw8epp30) **4**

[**4 Performance and Outcomes**](#_ffl7xu2j0885) **4**

[4.1 Applying Knowledge and Skills Learned at Hacettepe](#_xz50dweoljq9) 4

[4.2 Solving Engineering Problems](#_bpw4ogd4y1rp) 4

[4.3 Teamwork](#_u6lpqhbqxoz3) 4

[4.4 Multi-Disciplinary Work](#_cp0oytm21pkw) 5

[4.5 Professional and Ethical Issues](#_csmm3o9kt8cw) 5

[4.6 Impact of Engineering Solutions](#_g9vfihknoik5) 5

[4.7 Locating Sources and Self-Learning](#_pzho8nnv7pxy) 5

[4.8](#_b6rqjjby5ex1)  [Using New Tools and Technologies](#_ge3qv2cvevyu) 6

[**5 Conclusions**](#_eo3oe5p0knpf) **6**

[**References**](#_l3yfzzp7nwhl) **6**

[**Appendices**](#_b1o40pe12lxb) **7**

# 

# **1 Introduction**

Havelsan A.Ş are a company that develops defense systems for the Turkish Military. The main good thing about the company is that I have really felt that I was a small part of a working machine. I have been assigned a mentor to supervise throughout this journey to boost my learning. One of the reasons to attend the internship is to actually feel working for a prestigious company that has a direction and a vision.

I have participated in the parsing of the asterix formatted document in the internship program.

# **2 Company Information**

## **2.1 About the company**

HAVELSAN is founded in the year 1982 as a corporation owned by and affiliated to the Turkish Armed Forces Foundation.  
Aside from being accepted as one of the largest and leading technology firms of Türkiye, HAVELSAN is also a leading trademark in the international market as well with its deep-rooted experience, competent and specialized employees, and high-technology based software-intensive solutions and products.  
HAVELSAN does not only develop and produce technology in defence, security and information sectors, along with high technology and software solutions developed in-house, but also combines its own solutions and products with the solutions and products of other firms included in its business ecosystem, thus being able to present end to end solutions to its customers.  
Focused on software-intensive systems, HAVELSAN is offering and putting at the disposal of the Turkish Armed Forces (TSK), public administrations and entities, overall private sector and its own international customers its solutions comprised of genuine and original products and systems in the following fields:

* Defense
* Simulation
* Information and Communication
* Homeland Security and Cyber Security

## **2.2 About your department**

I have done my internship at the department of defense at the command and control department. Our team consisted of multiple team members. I and my other teammate were at the bottom of the command chain. Simply a team leader, multiple engineers and two interns were consistent at the team.

## **2.3 About the hardware and software systems**

This field includes private information about the company that cannot be shared by any of the working members.

**2.4 About your supervisor**

Provide the following information for the supervisor:

* Name and surname,
* address,
* telephone number,
* email address, and
* information about the education of your supervisor (including the name of the university and department from which he/she graduated, and the year of graduation).

# **3 Work Done**

The all-purpose structured EUROCONTROL surveillance information exchange (ASTERIX)is a set of documents defining the low level ('down to the bit') implementation of a data format used for exchanging surveillance-related information and other ATM applications. ASTERIX is designed for communication media with limited bandwidth. This is why it follows rules that enable it to transmit all the information needed, with the smallest data load possible.

ASTERIX is an extensible standard with a number of different categories, each of which deals with one particular kind of information. These include target reports from [surveillance](https://en.wikipedia.org/wiki/Surveillance) sensors such as [radars](https://en.wikipedia.org/wiki/Radar) as well as processed information such as aircraft tracks and various system status messages. Each category defines a number of data items which can be transmitted in a message. Which of these items are transmitted is defined in a User Application Profile (UAP), usually the default UAP provided by the standard document for the category, but optionally a more specialised UAP negotiated between sender and receiver separately.

My project was to parse the data given in the asterix cat-62 format. The main motive of this project is to decode the flight data and determine the desired fields and return them to the user using a hashmap.

According to the instructions I was given me and my teammate have created an XML file to help us with the parsing process. During development we used github as our main platform and did the version control using github tools and branches. To develop the code we used mainly Intellij IDE provided by JetBrains.

I have managed to parse the format to a <Varible> level which includes two subfields and does not contain any other spontaneity. However I have not managed to go to any other deeper levels and parse the data itself. Here is some pseudo-code:

Function (variable, number):

Get the fixed list

If the lengths match:

parse fixed

move the pointer to next fixed item

if extension bit is 1:

return 1, length of the next item

else:

return 0, 0

else:

return length of the item

# **4 Performance and Outcomes**

## **4.1 Applying Knowledge and Skills Learned at Hacettepe**

Debugging and problem solving are the skills that have came to my benefit at this assignment. The assignments that I delivered in Hacettepe University have given me a chance to think about solutions of the problems more deeply and give me an understanding of the approach to take during the problem solving process. Also the experience with the Java programming language has helped me to skip the learning process of Java.

## **4.2 Solving Engineering Problems**

Which engineering problems did you solve related to the computer systems and applications during your internship? Explain in detail.

## **4.3 Teamwork**

Me and my teammate worked through the file and tries to understand it together. He explained me details about the necessary things about the insight information that was needed to get the grasp of the file. That information was needed because after certain parsing acts in order to be able to judge the correctness of the data we needed insight. After that he took care of the renewing the XML file. Since he was an electrical engineer I started developing the code myself and we continued together for the rest of the project. Since this project was new we didn't really get to play a part in the rest of the teams projects.

**4.4 Multi-Disciplinary Work**

The multidisciplinary work mainly came and go between my teammate and me. It consisted exchanging information about the flight data details since I was not aware of the units. We worked as a team.

## **4.5 Professional and Ethical Issues**

I have not encountered any professional or ethical issues in the company.

## **4.6 Impact of Engineering Solutions**

In Havelsan all projects are developed with the following objectives:

1. To be a pioneer in, and give maximum contribution to, the satisfaction of strategic needs and demands of our country based on software-intensive technologies by national solutions.
2. As a strategical business partner, to act as a consultant and counselling firm in technology management processes.
3. To be a leading software development firm and a system integrator in the targeted regions at home and abroad.
4. To be an innovative, effective, efficient and highly competitive firm in its fields of business.

## **4.7 Locating Sources and Self-Learning**

I have read the documents related to the library XStreams. This includes the official documentation of the library and also the solutions provided on the internet such as Stack Overflow and github. Other than that I have read the document about asterix file format provided to me by my supervisor and also other documents on the internet regarding the official website. I have done the research due to gain additional information about the domain and understand the importance of my work.

## **4.8 Using New Tools and Technologies**

I have encountered a library called XStreams. The library is used to actually stream data from different formats including the XML format that I have worked with. I have came into contact with it through the suggestion of my mentor. I have learned it with the help of Youtube and the official documantary page of XStreams.

**5 Conclusions**

In this internship my job was to start a project to parse the data coming in as asterix file format. I had worked mostly with my teammate who is an electrical engineer and my mentor who was the head of the team consisting multiple team members. The project was not to finish under my time as stated by my mentor and the team will carry on the effort.  I had the chance to use the knowledge I learned in Java to use.

# **References**

Give proper citations to all of the resources you have used during your internship. When giving references, be sure to adhere to ACM or IEEE reference format. The reference examples should adapted from ACM and IEEE reference style suggestions that can be found at ACM and IEEE websites [1,2].

[1] “IEEE Reference Guide”. http://ieeeauthorcenter.ieee.org/wp-content/uploads/IEEE-Reference-Guide.pdf. [Accessed; Feb 27, 2019].

[2] “ACM Citation Style and Reference Formats”. https://www.acm.org/publications/authors/reference-formatting. [Accessed: Feb 27, 2019].

# **Appendices**

If necessary, provide any detailed information such as long code examples, extensive company information, images or results charts.