



THE SPACE INDUSTRY OF TOMORROW

A current state analysis of a customer oriented production facility

Method

A structured approach was selected as a guide for the work performed in this project. The aim was to provide prerequisites to find a balance between the development of the product and the production system. The main areas of this approach include market and company factors on a strategic level, product concept and supply chain, production engineering and development as well as production organization (1).

Key persons within different levels of the organization have been interviewed, based on the main areas of the approach, to establish a description of the current state and findings presented in the following sections. As part of this description, there is a flow chart of the physical transports of materials and goods, on a general level.

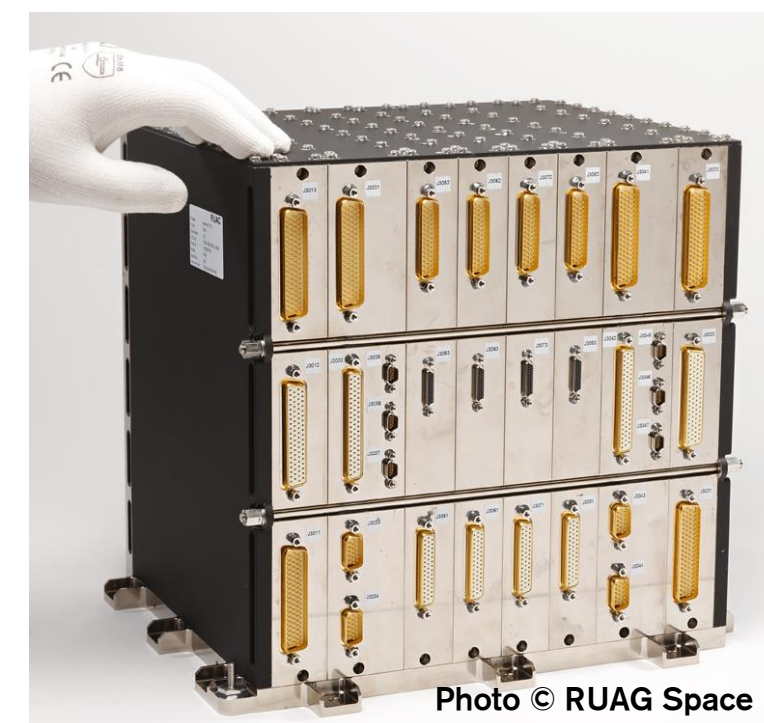
Market and company factors

Internet connectivity to anyone, anywhere

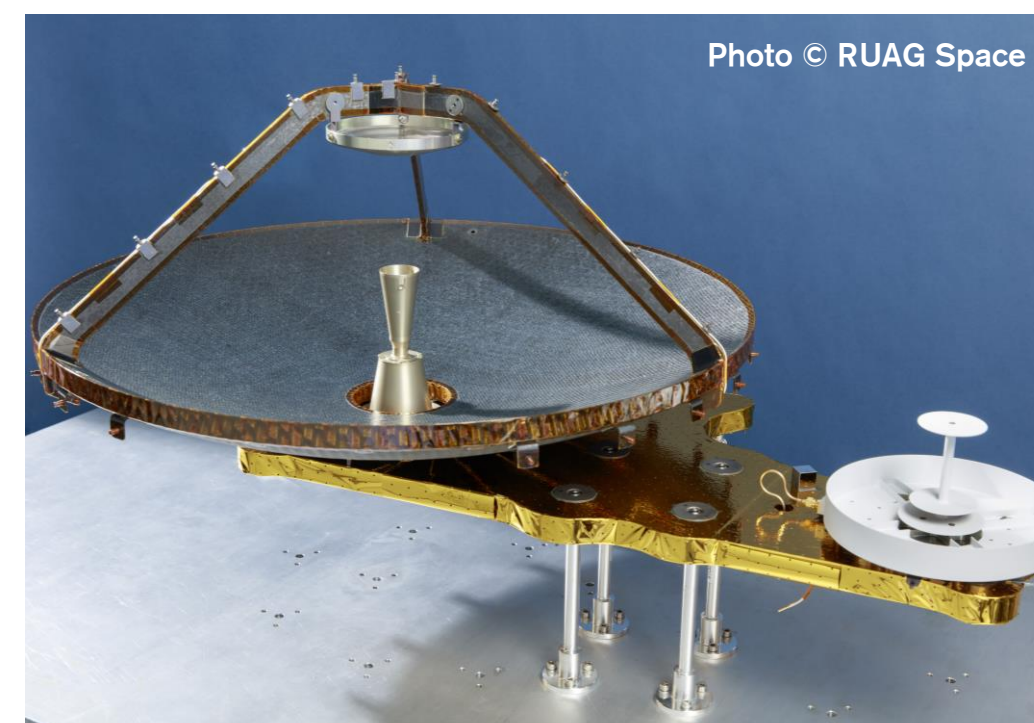
Access to information regardless of location is becoming increasingly important. Internet has had a major impact on the modern society, but there are still substantial parts of the globe that lack connectivity to internet. One solution, for worldwide connectivity, is covering the earth with hundreds or even possibly thousands of satellites (2). The RUAG Space Group is a contender on this emerging market, aspiring to take a leading role.



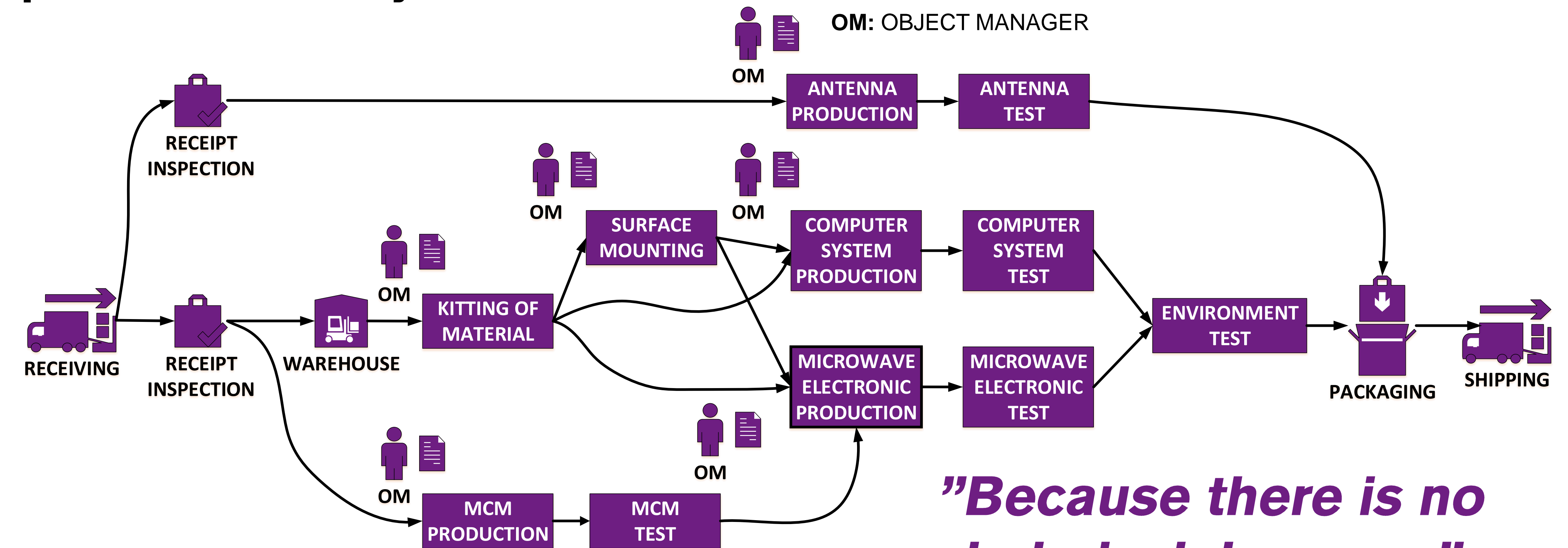
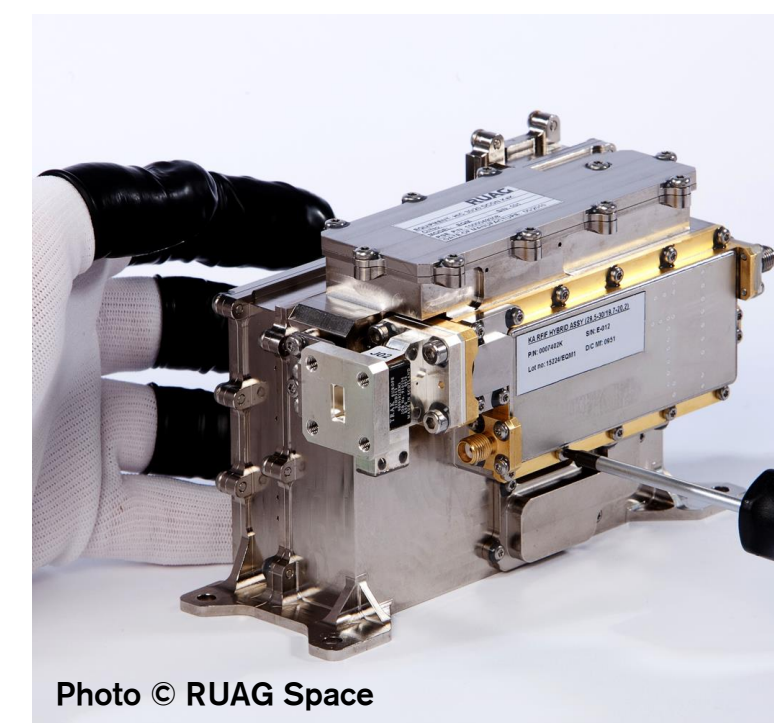
Computer System



Antenna



Microwave Electronics



“Because there is no helpdesk in space”

References

- (1) Bellgran, M. & Säfsen, K. (2005) *Produktionsutveckling Utveckling och drift av produktionssystem*, Lund:Studentlitteratur, pp. 236-237
- (2) Hanson, W.A. (2016) *In Their Own Words: OneWeb's Internet Constellation as Described in Their FCC Form 312 Application*, NEW SPACE, vol. 4, no. 3, September, pp. 153-167



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Number one independent space product supplier

RUAG Space, Gothenburg, Sweden, is a specialized manufacturer of computer systems, microwave electronics and antennas which are characterized by high quality, customization and low volumes. Existing production involves a high degree of manual work and extensive tests are performed with a large number of test equipment to verify products to specific customer requirements.

RUAG Space has the ambition to become a leading contender in new high volume space projects for communication satellites. This future market will require development towards an industrialized production in terms of vastly increased volumes with reduced lead times at reduced cost levels.

Information management as well as product development, supply chain and quality processes must be developed in order to ensure the ability to support a high volume production facility.

Production

Supply chain

The procurement department handles and coordinates material demands, but there is still a significant amount of purchase activities for material tied to specific customer projects. Procurement initiated on prognosticated or replenishment needs is increasing but is still limited by project component quality requirements.

Production planning

Planning is performed to meet individual delivery dates in each customer project and production is initiated by the object manager with an electronic work order. Each production group perform daily planning activities at a visual planning board which contains all work in progress.

Quality

Since there is no helpdesk available after launching a product there is no room for error. Quality is the main driver at RUAG Space and it includes extensive verification throughout all development, procurement and production steps. In production the verification processes include visual control by inspectors as well as functional and environmental testing of all produced units.

Personnel

Compliance to standards and customer requirements determine the level of training and education that the personnel need to have fulfilled prior to perform work on products. The extent of the training required is time consuming which has an adverse effect on the flexibility of the personnel.

Conclusions and future work

The strategic approach for the data gathering supported the possibility of identifying the current state with a broad overview of the company and the main drivers present within the organization.

The future work in this project will contain an increased level of detail that will be examined to determine which data that is necessary in order to be able to analyze a high volume scenario, an expected increase of 400 %. In addition, a second scenario shall be simulated in which the high volume products shall be mixed with traditional low volume products in a highly flexible production environment.