PROJECT

MOCONT

Monitoring the Yard in Container Terminal

Funding: European (5th RTD Framework Programme)
Duration: Jan 2000 - Dec 2001
Status: Complete with results

Background & policy context:
The project MOCONT is funded by the European Commission, DG INFSO under the IST Programme of the 5th Framework Programme and is attached to Sub-programme Area: Intelligent infrastructure and mobility management.

Most container terminals operate a Terminal Operating System (TOS). A TOS is a software tool running on standard PC boards, to record the positioning of containers inside the yard and to plan handling operations. TOSs are usually fed with manually collected information often unreliable or late. This is a major cause of several problems and reduces the effectiveness of terminals.

The project aims to provide TOSs with precise container positioning in the yard. To do so, the container locations are gathered from the field using a tracking system made of a GNSS coupled to inertial navigation sensors, and integrated with a visual identification system reading the container identification numbers. The system will be mounted on board handling machines. MOCONT will provide a working pre-prototype.

Objectives:
MOCONT is a tool for data capture and processing, covering different modes of transport, to support operations relevant to modal changes during containerised transport. The project aims at developing a system to trace the containers within the terminal yard in real time. It is composed of two parts:

1. a location and
2. an identification system.

The location system integrates D-GNSS and Inertial Navigation, and is dedicated (but not limited) to reach stackers. Reach stackers are ‘small’ container handling machines used in several ports throughout Europe.

The identification system will be applicable to any lifter, and it will be a visual-based one, since most terminal operators deny the application of tags on containers for identification purposes. With this aim, the solution does not imply any intervention on containers, or major installation of equipment on the yard, neither for location, nor for identification purposes.

Finally, an interface (the middleware) will be added to adapt the system to any TOS without changing its characteristics. The target is to eliminate time and personnel consuming control activities performed to check the status of the yard (i.e., the position of containers inside the yard). That is to say that, container handling shall be tracked by the system, reducing the intervention of human operators.

Methodology:
The work is based on a problem solving approach. It is a matter of increasing the reliability level of the information fed to and treated by Terminal Operating Systems. To do so, a system composed of a container location system and a container identification system is going to be developed. Both location and identification systems will be developed in order to be used and customised either as a whole (i.e.,
The solution proposed is expected to be opened to any possible TOS available from the market, in order to make the solution applicable to any container terminal already provided with a TOS. To fulfill such a preliminary requirement, the integration of the container location and identification system is added to the development of a middle layer interface -the middleware- which connects the two systems mentioned above with the TOS.

The research and development activities can be logically grouped into three main groups. The first group is composed of all activities dedicated to the definition of the overall system requirements, mainly developed with a tight and close connection between all partners. The second group includes all design and implementation tasks. During this activity, the design of location and identification subsystems will be completed. Then, the two pre-prototype modules will be realised. The third group deals with the project assessment and evaluation and with dissemination and exploitation activities.

The assessment and evaluation phase is performed throughout the whole project lifetime, accompanying the technical work and assessing the results achieved. The dissemination and implementation phase starts with a workshop, i.e., a dissemination event performed through the end user club (a group of end users not member of the partnership), which is expected to feed the requirements with some remarks, comments, and even recommendations.

At the end of the project lifetime, visits to the site of end user club members will be set. Moreover, a MOCONT web page will be implemented and updated whenever a major result is achieved.

**Parent Programmes:**
**FP5-IST KA1 - Systems and services for the citizens**

**Institute type:** Public institution

**Institute name:** European Comission, DG Information Society

**Funding type:** Public (EU)

**Partners:**
- SCIRO S.P.A, Italy
- Micro Computer Components - MCC - di Iraci Stefano & C. Snc, Italy
- Terminal Darsena Toscana S.R.L., Italy
- Universita degli Studi di Genova, Italy
- Ikerlan Sociedad Cooperativa Ltda, Spain
- Trimble Navigation Europe Ltd, UK

**Organisation:** SCIRO S.P.A  
Via Gavotti Antonio

**Address:** 5/6

**Zipcode:** 16128

**City:** Genova

**Contact country:** Italy

**Telephone:** +39-01-5702652

**Fax Number:** +39-01-5702060

**Key Results:**

The objectives which had been fixed at the very beginning of MOCONT Research Project, summarised in the final report, chapter 2: Overview of the objectives of MOCONT research project, have been successfully achieved at the end of the two-years work, as shown by the description of the first MOCONT working prototype in Chapters 3 to 8.

The project satisfactory results have also produced, in the last weeks of the project life time, a further
interest from the European Commission who decided to co-finance a take up measure, acronym MOCONT-II, in order to equip a fleet of reach stackers with 8 MOCONT 'boxes', and test their behaviour during six months of normal operation.

Policy implications

MOonitoring the yard in CONtainer Terminals - TrIals - MOCONT II
The objective of MOCONT-II is to verify the impacts MOCONT has on the operation of a container terminal. The specific target is to investigate the potential of MOCONT leading to a marketable industrial product.

From an economic and financial point of view, the aim is to estimate the return of investment a terminal operator may have using MOCONT, together with the business opportunities for the supplier. Economic and financial analysis will be the key to show the benefits of the technology application.

MOCONT-II will realise 8 replications of the MOCONT functional prototype in order to equip a fleet of reach stackers. The fleet will operate for a period lasting 6 months and relevant data will be collected for off-line evaluation. The analysis will allow a thorough evaluation, ranging from the economic impacts on the terminal operation and management to the reduction of handling time, to the impact on the working conditions for the terminal workers.

Intermodal

MOCONT is a tool for data capture and processing, covering different modes of transport, to support operations relevant to modal changes during containerised transport. The project satisfactory results have also produced, in the last weeks of the project life time, a further interest from the European Commission who decided to co-finance a take up measure, acronym MOCONT-II, in order to equip a fleet of reach stackers with 8 MOCONT 'boxes', and test their behaviour during six months of normal operation.

Documents:
- MOCONT_Final_Report.pdf (Final report)

STRIA Roadmaps: Network and traffic management systems
- Water transport (sea & inland)

Transport sectors: Freight transport

Geo-spatial type: Infrastructure Node