

Why industrial robot OEMs should care about ROS

12 May, 2013

ROScn, Stuttgart



Robot Evolution

Production Robots

ROI model requires medium to large lot sizes

Repeatable tasks, few program changes

Programming from “robot expert” or engineer

Robot does not share space or interact with people

Fixed installation, or positioners



Robot Evolution

Production Robots	Production Partners
ROI model requires medium to large lot sizes	ROI achieved even with small lots
Repeatable tasks, few program changes	One-off tasks as standard
Programming from “robot expert” or engineer	Programming by shop floor operator using intuitive direct-teaching methods. Automatically generated programs are also prevalent.
Robot does not share space or interact with people	Space is shared (no fences) and interaction is frequent (parts loading, Intelligent Assist Device)
Fixed installation, or positioners	Robots freely deployable to needed work zone. Arms on manual or automatic carts.

ROS + Yaskawa



- In conjunction with SwRI, we developed a ROS interface to allow researchers to develop new functionality around our 7DOF robots.
- Now also support 6DOF and (soon) dual arm control
- Full robot speed, stream points at ~30Hz, URDF models available
- OEM supported

ROS + Yaskawa



- The value in ROS is the applications that it makes possible

Typical OEM criticisms regarding ROS...

- Robot OEMs already have expertise (aka “not invented here”)
 - This is indicative of a lack of understanding of what ROS offers.
- ROS adds little value to process robots
 - Paint, spot welding, arc welding make up the volume of industrial robots. ROS does not address these processes.

Pick and Place

June 13, 1961

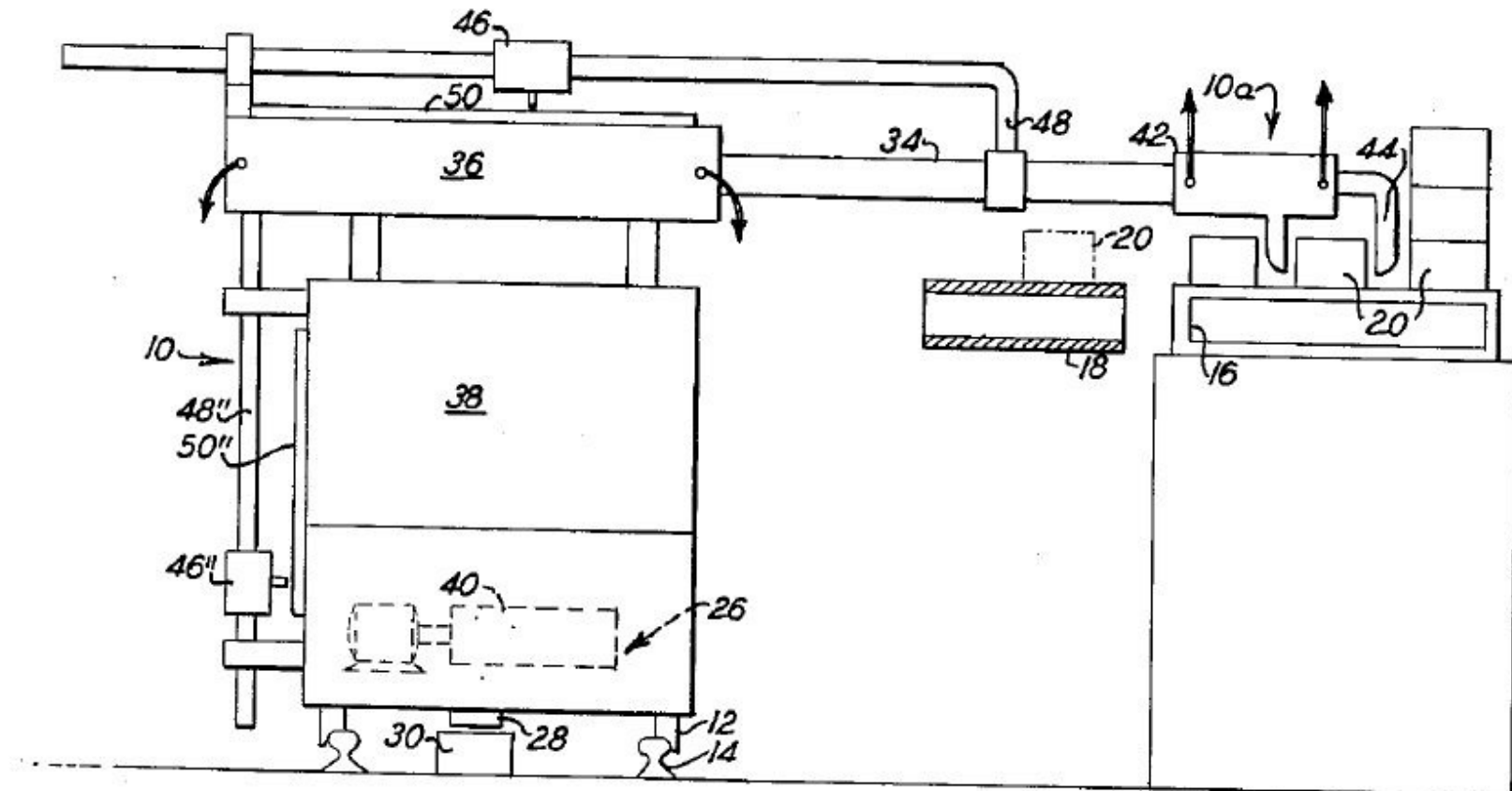
G. C. DEVOL, JR

2,988,237

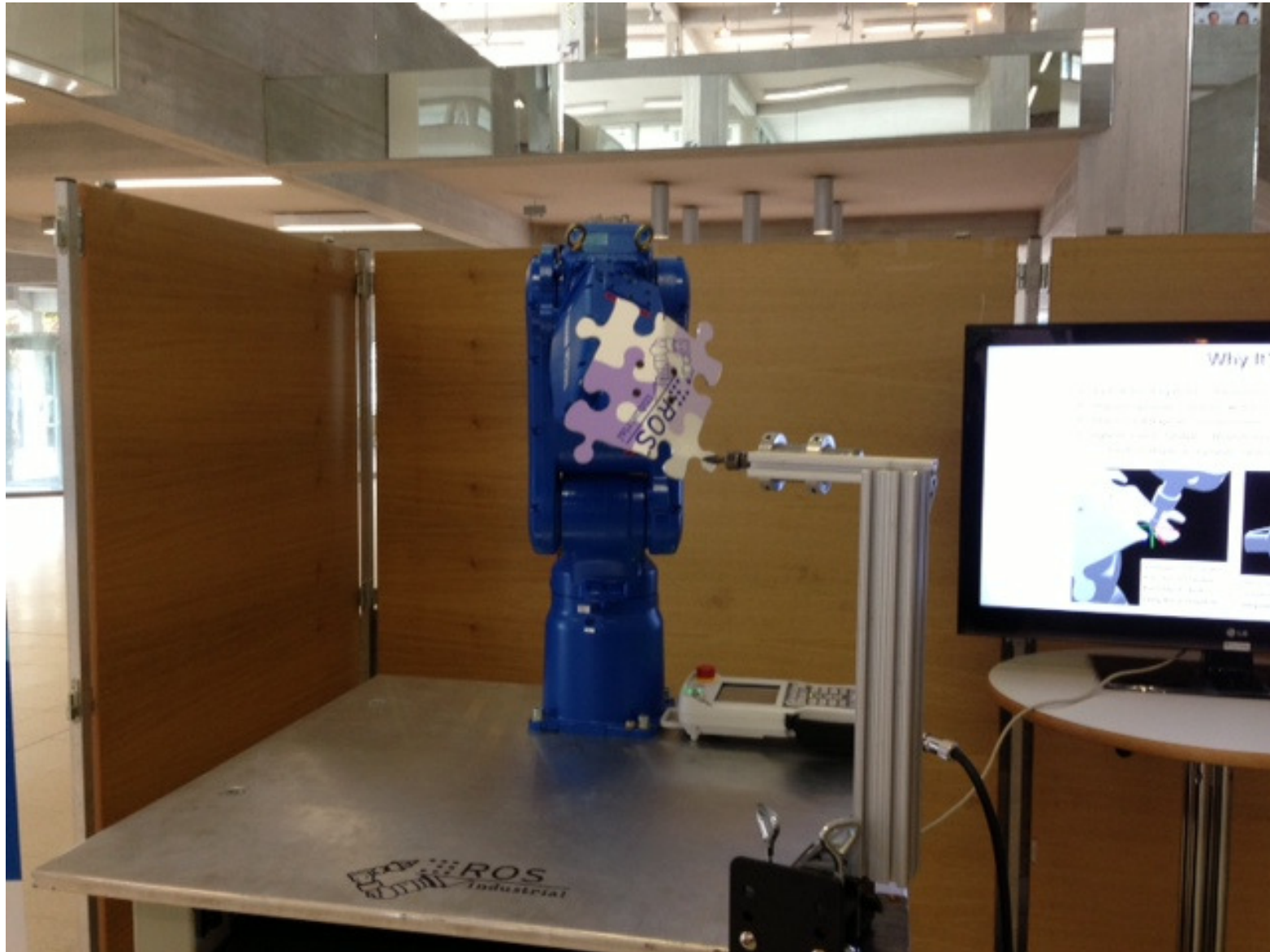
PROGRAMMED ARTICLE TRANSFER

Filed Dec. 10, 1954

3 Sheets-Sheet 1



Beyond Pick and Place



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 - Paint, spot welding, arc welding make up the volume of industrial robots. ROS does not address these processes.
- OEM's are not startups and don't need open software to reduce costs
 - The principal value of ROS is not in the cost structure
- Open source software is unreliable and an unacceptable risk for a mature market with low tolerance
 - Most common criticism, but ignores 10+ years of IT with open source performing in mission critical applications. ROS-Industrial mitigates risk.

The “Open Source” issue

- Open source software is unreliable and an unacceptable risk for a mature market with low tolerance



3D printer



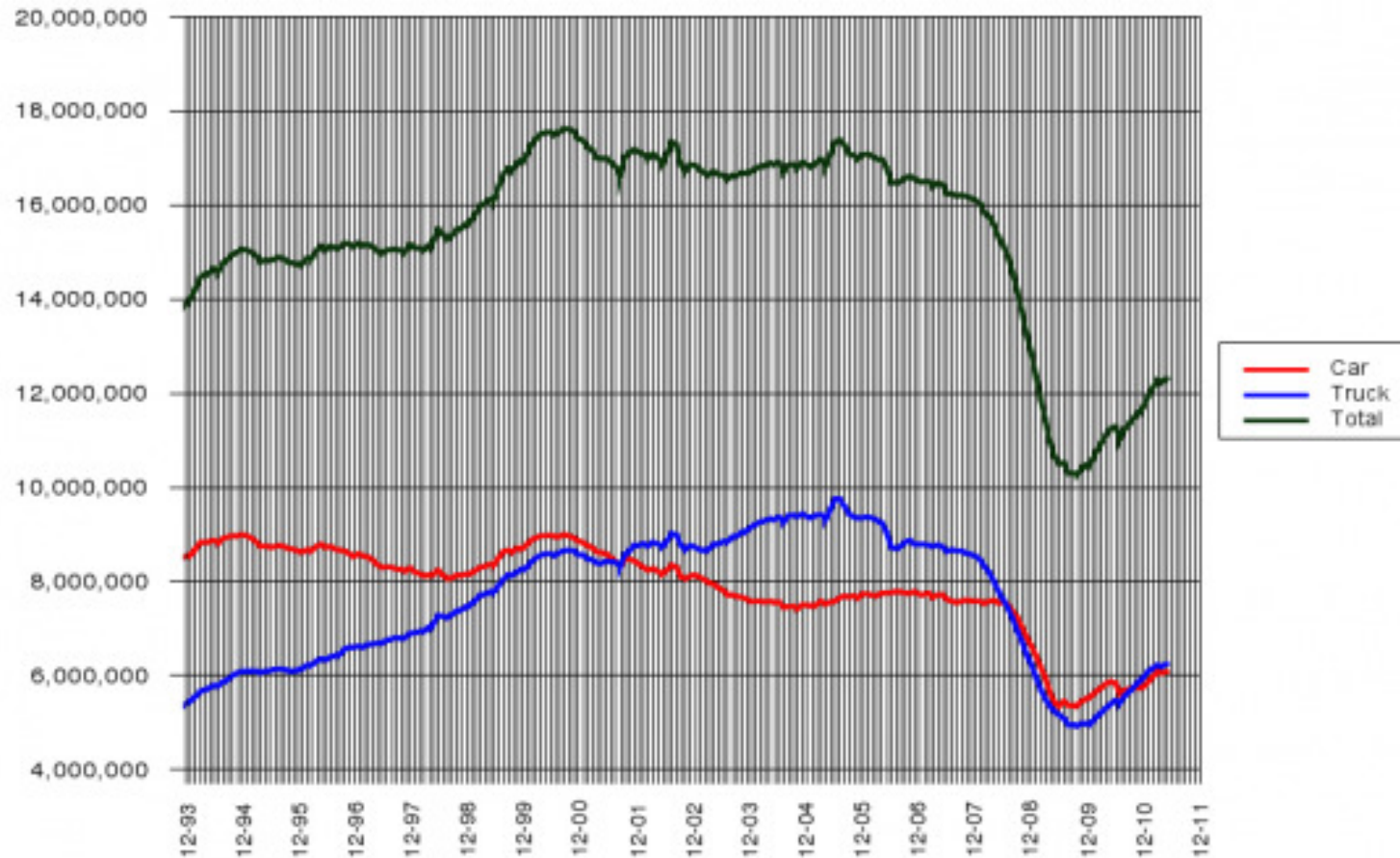
NC mill

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- Open source software is unreliable and an unacceptable risk for a mature market with low tolerance
 - Most common criticism, but ignores 10+ years of IT with open source performing in mission critical applications. ROS-Industrial mitigates risk.
- There is little that ROS offers that impacts the robots we sell today
 - If your business plan for tomorrow can be met with “today’s applications”, then you are correct, but...

But today's applications...

107k robots shipped
64k to Automotive



US SAAR history

Business case for ROS

- As OEM's we recognize that our dependence on automotive and heavy industry is a business risk.
- Automotive is cyclical and we cannot depend on a SAAR above 14M units
- The strongest mitigation risk is to diversify into other industries
 - Logistics, consumer goods, food, medical/clinical, rehab, recycling
- New markets require new robot functionality and the OEM's are not in a position to deliver
 - Our development resources are consumed with servicing our existing business.
 - Treadmill development means maintaining robots up to new standards (RoHS, ISO, CSA, ANSI/RIA) and customer requirements (new manipulators, tweaks to functionality, HMI's)

ROS value to Industrial Robot OEM's

- ROS itself is not the value. The applications it enables are the principal value.
- All the interesting peripherals and algorithms will be developed on ROS first, long before they are developed for a specific OEM platform.
- OEM's that have a robust interface to ROS will be at an advantage in time-to-market for these new capabilities.
- ROS offers a development community that is not encumbered by maintaining existing business.
- The ROS-Industrial effort is indispensable. As manufacturers, we must move to a hardened, stable version of ROS from which to work.
- ROS developers are the next crop of robot talent. When OEM's look to hire developers, these are the types of people we look for.

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