DRESSLER AUTOMATION

RoboLive® Valuation Description: For Commissioners

Intro

RoboLive is a toolset that improves robot programming efficiency and provides insights for commissioners of industrial robots. These characteristics are achieved through;

- automation of programming tasks
- increasing the capabilities of computer simulated environments
- producing insights through real-time data analysis
- organizing and distributing information seamlessly, in highly intuitive and actionable formats.

As implied by the name, RoboLive provides this information frequently enough to be considered a 'live' monitor of the robot systems; rather than an analysis tool which processes backups that are subject to obsolescence if changes occur after their creation (provided any upstream file attainment is proficient). The system includes a server and client application used to view information produced, as well as additional optional applications. The RoboLive server can be securely accessed via the internet ("cloud" based), or on a virtual machine deployed on the same network as the robot systems it analyzes, and the information produced is widely distributed to all users through an application installed on Windows PCs.

Value Proposition

In order to ascertain the value of RoboLive to a commissioner, three types of wage cost reduction which contribute to profitability are analyzed on a project basis. Their individual contributions are quantified and summed to produce a total valuation. Return on investment can then be computed based on the RoboLive price over the project.

Operating costs are reduced through RoboLive's ability to reduce hourly needs for workers performing tasks of robot commissioning and programming corrections. Overtime premium reduction is also considered.

Robot commissioning wage reduction

RoboLive contributing elements: Process Visualization, Robot Path Calibration, Vehicle-0 Determination, Robot Software Overview, Device Logic Insertion, Robot Documentation

The percentage of robot commissioning time reduced through RoboLive use is determined and multiplied by the total robot commissioning time required (without RoboLive). With the hourly labor rate for robot commissioning, the total cost saved is found. The result is the **commissioning wage reduction value**.

$$W_C = (\%\ of\ robot\ commissioning\ time\ reduced) * (robot\ commissioning\ time\ per\ line) * (quantity\ of\ production\ lines) * (robot\ commissioning\ hourly\ wage)$$

Programming correction wage reduction

RoboLive contributing elements: Process Visualization, Vehicle-0 Determination

Programming correction time is another wage reduction component enabled through RoboLive's provision of precise information, problem identification, and program banks with prepared corrections. RoboLive significantly reduces the number of iterations required to manufacture parts to specifications. The **programming correction wage reduction value** is computed similarly;

$$W_P = (\%\ of\ programming\ correction\ time\ reduced) * (programming\ correction\ hours\ required\ per\ correction) * (programming\ corrections\ required\ per\ project) * (worker\ hourly\ wage)$$

Overtime wage reduction

RoboLive contributing elements: Process Visualization, Robot Path Calibration, Vehicle-0 Determination, Robot Software Overview, Device Logic Insertion, Robot Documentation

The final component considered is the overtime wages reduced as a result of RoboLive use. Overtime premiums paid to employees that are reduced through the efficiency improvements provided by RoboLive are quantified by the **overtime wage reduction value**.

$$W_O = (project\ overtime\ hours\ reduced) * (overtime\ premium)$$

The value of total wages reduced is computed by the addition of the subcomponents.

$$W = W_C + W_P + W_O$$

This calculation assumes hours reduced can result in cost savings from workers being productive performing other tasks or being unscheduled.

Final Metrics

Project valuation and ROI

The **total project valuation of RoboLive** is given by;

$$RoboLive\ Value = W_C + W_P + W_O$$

Because the RoboLive price structure involves a price per project implementation and a time-based service price for server access and options, the **RoboLive price** depends on the project duration.

$$RoboLive\ price = (Project\ implementation\ price) + [(Server\ price + Options\ price) * (duration\ in\ months)]$$

The **return on investment** (ROI) is calculated as;

$$ROI = \frac{(RoboLive\ value) - (RoboLive\ price)}{(RoboLive\ price)} * 100\%$$

The RoboLive server and options services are not limited to any number of projects. These time-based costs can therefore remain constant while the value of RoboLive is scaled to an unlimited number of implemented projects.

Unquantified Benefits

Many improvements which cannot be shown to materially affect profitability are unconsidered in this valuation. Elegant tools like RoboLive can improve morale among workforces, leading to increased productivity, among many other possibilities. Seeing innovation embraced and implemented can inspire further innovation, providing a viscous cycle of benefits potentially extending far beyond the quantified value.

Efficiency improvements in robot commissioning during the new model startup phase have substantial unquantified benefit potential as well. Robot programming requires other work in common areas to be halted, and is often a major component on a project's critical path. Even without an SOP advancement, improved efficiency in this

area can provide increased time available for other lower priority work or refinements, which can result in reduced downtime, better performing equipment, improved morale, and ultimately happier customers. The ability to have accurate vehicle-0 frame data without laser measurement time and costs at an early project stage can also yield significant additional value. Possible long-term benefits can be realized such as increased capacity (or reduced staffing needs) and reduced costs for contracted services benefiting from RoboLive.

Dressler Automation's mission is to positively affect humanity using automation to enable widespread availability of beneficial resources and experiences. RoboLive is one method we've created in pursuit of that end.