A State POR Research Port	Research Paper	Engineering
	Information based Networking and Database for Manufacturing with Ambient Intelligence	
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ABSTRACT In thi econo is field	is ever changing environment the field of manufacturing which plays a vital ro omy has to adapt to new techniques and ways of approach to sustain in globaliz d which involves high range of information sharing within its floor as well as bet	le in each and every countries ed market. The manufacturing ween the departments such as

Human resource, Maintenance, Sales, Logistics which not only supports but also boons its performance in company's overall standing among its competitors. To be market performer the company should look at its Information sharing capacity within its departments which help each other to do its activity productively and effectively. The paper is about making data and information about the company's various departments and its activities, information supporting them to carry out their functions centric i.e. integrated in single database with ambient intelligence technology as a support in shop floor which would help in monitoring activities of people in the floor. The main study will be focused on bringing all those information get integrated for sharing data to manufacturing department to overcome its stochastic nature of working. The information based networking is controlled and supported by AmI as AmI is an emerging trend in smart home environment. This AmI is a technology which brings electronics and Human Activities together to make life more easy and pleasure.

KEYWORDS : Ambient Intelligence, Networking, Information Technology, Database

1. INTRODUCTION

Ubiquitous computing features the seamless integration of computer systems into the everyday lives of users to provide information and functionalities anytime and anywhere [1]. The approaches and technologies for supporting these new ways of working are still under investigation. Nevertheless, a particularly interesting trend in ubiquitous computing is exploring the Ambient Intelligence (Aml) paradigm, a multidisciplinary approach that aims at the integration of innovative sensing, communication and actuation technologies in order to provide users with an environment that offers services when and if needed. Particularly, AmI systems are characterized by being (a) unobtrusive, i.e., its services must not intrude on the user's consciousness unless he needs them; (b) personalized, i.e., it must be able to recognize the user and tailor its behavior to the user's needs; (c) adaptive, i.e., its behavior can change in response to a person's actions and environment's context; and (d) anticipatory, i.e., it must anticipate a person's desires and environment as much as possible without mediation [2]. Aml applications are intrinsically context-aware and hence require the support of middleware systems that provide services not only to store, distribute and process context data collected from different sources, but also for reasoning about context information. Reasoning is required for identifying specific context-dependent situations, which may be described as particular combinations of states of aggregated context data that define relevant conditions for triggering actions or adaptations in applications or services [3]. In Aml environments, the intrinsic complexity of reasoning is increased by the fact that in some conditions it needs to be performed in a decentralized way, involving several entities of the system, such as entities representing devices, users or ambient resources [4]. In such scenarios, despite usually there are no computational limitations for the ambient infrastructure to store or process the large amounts of context data necessary for performing reasoning operations, privacy issues may prevent the user from accepting the disclosure of his personal information, such as his location or personal preferences. On the other hand, the reasoning computation may be too heavy to be performed by the resource- mobile device. In this work we propose a middleware service for performing decentralized rule-based reasoning, in which two parties — each having access to different context information interact in the reasoning process to find a result

working model for manufacturing we discuss a possible change in the model and use of Aml in it activity.

2. NETWORK STRUCTURE:

The current Network structure of the company is very limited and has an own web mail server where the information is shared through mails and has no great or desired IT infrastructure. The Web is connected to the head office with the plant offices. The plant office has different departments where it is connected by the LAN and the follow up of orders are done using this LAN.[5]

The above information model is one of the simple models where the departments are linked to each other by the company's own web mail services. The information is passed through mails to different departments and this setup also lacks in security as its open without any firewall. This conventional type of sharing information is found not that useful as the business model have grown and has a wide and fast growing market which needs change at regular interval.

3. INFORMATION FLOW

The information is shared in such a way that the customer orders are received through sale order to the head office where the order is transferred to the plant office through their private webmail network and from there the order is placed to the logistics which is responsible in the follow up of order inside the plant. The order is sent to the production floor with required material and the follow up and tracking is done through just the telephonic conversation within the plant offices employees. The IT model seem to be a simple system which do not holds its position in this ever changing environment and this kind of system do not help in tracking the product position and workers motivation towards finishing the orders. It involves a lot of manual supervision which is not that easy to carry out in making a mass order to be done on time with required quality

4. REQUIREMENT ANALYSIS:

After a clear study on the literature we can get an idea on what are the requirement that would help in implementing the proposal of information based networking and data base for manufacturing with Aml technology. The custom need for an industrial networking are it should have

The paper deals with a company which carries a conventional Net-



- ✤ A well designed System Architecture.
- A well equipped Networking Environment.
- A well distributed Database for reference.
- A good Operational and Functional Schedule.

5. SYSTEM ARCHITECTURE AND NETWORKING ENVI-RONMENT

For an industry to have a good network and data base for its functional and operational activity it should have well designed system architecture. The designed must flexible and adoptable to any new changes or technology when needed in implementation. The system that is designed must be reliable and secured as the information flow must be protected and must be efficient and effective in its service. The design must also provide a good mapping to host locations in its design. The system architecture should be user friendly and must be able to get changed when user need changes. It should be modifiable rather changeable when need arises. The networking environment must be free from complexity in building up network models. Networking also involves cabling which must make the area free from havoc. The cabling in that area where men and material movement is more should be well organised and routed correctly for any future repair and maintenance. The networking environment must also support the feasibility of operation.

The system must be supported by a well build and organised database for the concept of sharing information at any instances. The data must be retrievable and even under certain authority changeable by valid and authorized personals. The data structures must be clear in its information. The concern towards the operational and functional schedule must be taken into account at all cases of networking. The integration of network with good database system will help in making the system a useful tool to get information regarding the activities that are happening.

6. AMI DESIGN

Our proposed information system for is built in such a way that it integrates all departments in one single network and makes the departments synchronized with all its resources available at all stages to make the information available for all departments to have the production done at right time with better tracking of its orders by the Head office. The information system will also assisted with Ambience intelligent technology in manufacturing floor which will assist in monitoring the workers and guide in making them decisive actions on some critical situations that happens during the production. The critical situations are mostly decisive factors which affects the product delivery and lead time.

The projects include the following activities to find the factors which define the implementation of information based networking and data base with Aml. They are

- Studying on shop floor activities and factors which affect lead time.
- Collecting data for creating database of products and availability at all stages.
- Creating a database of those products and its raw materials...

- Creating database of those factors and analyzing the same for solution to those issues.
- Synchronizing those data and information with Aml environment and its users.
- Design of system with all required features.

With reference to the literature review carried out the Aml system we have proposed is to make a case driven Aml architecture which can be divided into four main steps they are

- 1. Context identification.
- 2. Context modelling.
- 3. Context comprehension.
- 4. Assistance Action.

The above case driven Aml the shop floor is the context space were the Aml is implemented the context identification were the raw data are identified using the sensors and the sensors senses the activity and sends to context model this context model studies the sensed data and then sends back to the case comprehension and this case comprehension model derives the reasons for the model cases. The reasoning is act of finding optimum solution or may be called as required information for the sensed data or required data which was got from the context space [8]. These reasons are sending to assisting layer which is a collection of required information for the users in context space to assist them in making a decisive action on the query. The assisting information is then sending to the context space. The context space receives the required information to guide the user on decisions to be carried out. The Aml model is shown below.



The various layers are made to do its purpose of application. The context layer consists of three layers integrated in it they are

- I. Sensing and perception layer
- II. Middle ware
- III. Recognizing Layer

The three layers one which makes contact with the environment which has AmI implemented.

The sensing layers are which senses the activity of the Aml environment. The sensed data is then send through the middleware to the recognizing layer which used to recognize the sensed data to filter the required data to pass it to next level of the model the context model which carries the representation layer. It gives the representation to recognized information so it would be further studied by the next model case comprehension which gives a structured solution for the sensed data which needs a solution. Then this is followed by assistive model which comes out with required assistive ideas for the context that was sensed and it is a closed loop model which has its link with the Aml environment [9]. The assistive layer is solution model for the environment.

7. CONCLUSION AND FUTURE WORK

The Aml model that has been proposed would bring a well-organized, integrated environment for manufacturing which integrates the real life scenario with the electronic world to make the manufacturing more desirable and dependable. Our proposal of using Aml with production as a tool to identify causes that would results in increased lead time, false information, less quality. The system we have propose has a limiting use and it is just an idea on how Aml can be used which now a days have a wide scope only in the field of smart home needs. Now those concepts are made use in manufacturing activities also. Though the smart needs differ from home to industry we can use those simple logical Aml reasoning and Assistive action to make the factory a smart environment to work with.

The future work is such a way that they can be further studied on the actual happening inside a production floor and with those knowledge Aml and production we would extend our scope of project to use at all levels of production were supervising is not that efficient and floor with mass production and rapid speed Aml can be used to monitor and make it a smart environment. As Aml is an advanced approach to smart work environment the application is first limited to make an implementation which on later study would be applied at levels of the factory activities.

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