

SEPTEMBER 2015



CHRIST
UNIVERSITY
BENGALURU, INDIA

Declared as Deemed to be University under Section 3 of UGC Act 1956

VOLUME : 5 ISSUE : 48

SIGMA

NEWSLETTER



An initiative by

Lean Operation and Systems

Institute of Management , Christ University

"The key to the Toyota Way and what makes Toyota stand out is not any of the individual elements - but what is important is having all the elements together as a system. It must be practiced every day in a very consistent manner, not in spurts."

- *Taiichi Ohno*



"The result of long-term relationships is better and better quality, and lower and lower costs."

W. Edwards Deming



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-Abey John Jacob

Nowadays, student community in India is often found in a state of transition relocating from one place to another in pursuit of higher education or jobs. When they pass out from colleges, they are left with excess of commodities that they don't require anymore and carrying it to their new location is not a feasible choice. On the other hand, we have these new batch of students joining the colleges who are in need of the same items, but don't want to spend much on it owing to the fact that they will be using it only for a short span of time.

For example: - Students want to easily dispose the old books (which they won't be using in future or is easily available online) piled up in their home/hostel. They are now relying on local kabadiwalas who buy these costly books at very cheap prices (usually at weight rate) and resell them to local second-hand bookstores. The same books are sold to the new batch of students at a higher price which is inclusive of profit margin of these middlemen.

So the Mycampuskart (MCK), an online classifieds website was born out from this novel idea i.e. to provide a convenient platform to facilitate easy exchange of goods between students. MCK provides opportunity for students to directly interact with the prospective buyers (mostly other students from the same campus) and get a better return on their possessions. On the other hand, it also helps students to easily discover and get hold of these commodities at a very low price. The commodities can be exchanged at a convenient location like their respective colleges or even at home/hostel. The pricing of the item will be at the discretion of the sellers but could be negotiable.

So how different is MCK from the existing players like OLX and Quikr? MCK specializes in addressing the needs of students at campus level and at providing the best customized quality of service. This means that if you are new to college and don't know where to acquire some prescribed course packs, then you can easily explore it through MCK.

Some of the additional functionalities that will be incorporated through MCK are:

- Users can also create wish list of the books they require and an automated email is sent to them when similar books are uploaded.
- To ensure transparency in the credibility of sellers, rating mechanisms can also be included in future.
- Chat boxes to enable effective communication between the sellers and prospective buyers.

The screenshot shows the MyCampusKart website. At the top, there's a navigation bar with a 'Contact Us' button, input fields for 'Email' and 'Password', and 'Login' and 'Signup' buttons. Below this is the 'MyCampusKart' logo with the tagline 'Your Campus, Your Deal' and a 'Post an item' button. The main content area has a blue background with a grid pattern. It features three steps: '1 Select College', '2 Upload Item', and '3 Get Buyers'. On the left, there's a search bar, a 'Select Category' dropdown, a 'Select College' dropdown, and a 'Search' button. On the right, there's the text 'Connect Explore Discover' and a description: 'A community span across colleges to explore the trending deals in your campus and to grab the best offers.' with a 'Post an item' button.

Mycampuskart kicked off their operations on August 12th, 2015 in the MBA department and was greeted with a warm response of over 100+ new user registrations within the first week. The immediate plan is to reach out to other UG and PG courses in Christ University to make them aware of this online facility. In future, the other universities can also be included in this venture.

The MCK team is also driven by a huge social cause – to reduce the consumption and wastage of resources by encouraging reuse of the commodities. According to a recent report from MHRD (Ministry of human resource department), there are 642 Universities, 34908 colleges and 11356 Stand Alone Institutions for higher education in India. The student population is increasing at a startling rate and hence there is a huge scalability for the solution provided through MCK.

Will Goods & Service Tax (GST) ease Supply Chain Cost?

-Nirupam Chatterjee

With so much of debate going in the parliament regarding goods & service Tax (GST), the main debatable question is: what would be the ramification of rolling out GST bill & how far it would impact? First & foremost, the GST arrival would help lessen the tax woes by fixing the current complex, cascading indirect tax regime. Secondly, GST would reduce logistics cost, depending on the extent to which companies are able to re-organize their supply chain. This bill would help in removing central sales tax (tax that is paid on inter-state movement of goods), which is at 2% of sales that firms are paying currently.

GST would replace all kinds of indirect taxes, to name a few will include – luxury tax, entertainment tax, octroi charges (Tax that is collected when it enters a state – applicable only in Gujarat & Maharashtra), VAT, service tax etc. and will be implemented by central & state government as Central GST & State GST respectively. Let us see a simple example with table shown below –

| Stage of Manufacturing | Input Cost | Output value | Value addition | Tax rate | Selling price(Including Tax) | Tax Burden | Earnings |
|------------------------|------------|--------------|----------------|----------|------------------------------|------------|----------|
| Manufacturer | 0 | 100 | 100 | 10% | 110 | 10 | 100 |
| Whole Seller | 110 | 150 | 50 | 10% | 165 | 15 | 40 |
| Retailer | 162 | 220 | 70 | 10% | 242 | 22 | 55 |
| Total Tax | | | | | | 47 | |

% Tax collected = $47 / 242 = 19.4\%$

As we can see, by the time the product reaches retail market, the product is sold with an extra tax burden of almost 20%. This is how one ends up paying tax on tax (compound tax) & cough out more money from individuals pocket. One would not have to pay taxes to this extent once GST is implemented as the concept of compound tax would be removed. Besides GST would improve simplify the whole procedure and would make India a single unified market, thereby making tax collection much easier. It also makes it easier for the government to certify that the taxes have been paid properly. And for the consumer, it ensures benefit through reduction in prices, incentivizing greater consumption. All in all, GST indeed helps everyone.

According to CRISIL research report, rolling out of GST will result in logistics cost of key sectors to drop up to 1.5 to 2 % of sales in a period of 2-3 years which would be a reduction of about 20% from current levels. Once GST is introduced, it will eliminate the need for setting up warehouses in every state in order to avoid central sales tax & hence eliminating redundant warehousing in the supply chain. This would lead to other benefits such as less stocking points, use of efficient bigger trucks to transports products, reduce transit time by reduction in paper work etc.

Problems in GST bill

- Assignment of 1% additional State tax by the central government in which supply originates. This tax would be added to cost of goods
- Central government to compensate the loss arising out to states on implementation of GST for a period of 5 years.
- GST proposal is not friendly to service sectors like bank as the tax levied for every bank transaction (for exports of goods/services) can be more than present service tax (14%).
- GST excludes products which have the potential to earn higher revenue from its sale. A few of them are liquor, petroleum products, real estate transactions, tobacco etc.

With the introduction of GST bill complemented by government initiative's such as "Made in India " program have the potential to drastically bring down costs & re-define economy of India. Also there a huge opportunity for Logistics Company to relook their supply chain & reduce product delivery cost. Now that the cabinet ministers has finally approved GST, the bill would now be drafted & be presented in winter session of parliament& hopefully it gets implement in next financial year.

“DESTRUCTIVE KAIZEN”

– AmolNanawaty

We all know Kaizen is a system of continuous improvement in major aspects of an organization like technology, processes, culture, productivity, safety, quality and leadership. It's used to describe a company culture where everyone, from the top management executive to the assembly line operator, regularly evaluates his or her work so as to think of ways to improve it. The concept is quite simple: improve through small steps on a regular basis which will lead to large improvements over time. This cascades into smaller benefits manifesting themselves into larger ones.

But a major question to contemplate is whether lean events like Kaizen actually increase employee morale and culminate into operating efficiency. This perplexity aroused in me because of my recent reading of a particular organization where Lean events like Kaizen and continuous improvement had been the headspring for diminishing employee motivation and interest rather than effecting positive change. It was learnt that the organization was suffering with what I would call "Destructive Kaizen". Top Management of the organization weren't aware of it. It was only after employees and workers were questioned that it became clear that the lean events like Kaizen which were introduced in the previous year had served to diminish employee morale and interest.

This preposition made me ponder over a basic question- "Can organizations venturing into many Kaizen events in turn come to halt as being risky ventures?" On one hand, these events yield significant improvements in workflow efficiency in a short period of time and leave

employees feeling energized and excited from the experience. Conversely, these results can become addictive for top managements, thus leading to the belief that ongoing events are the fastest way to drive continuous change and improvement. But for employees, the entire experience can begin to feel overwhelming and ineffective. Thus there needs to be a rationale behind every move you make in the organization with respect to Kaizen events or any other event for that matter. We can ascertain the position of such events by trying to answer three basic questions:

1. Are your goals clear?

When Warren Buffet started as an investor, his objective was simple: to earn profits from his investments in order to increase his wealth. Providing to the world enormous investment knowledge was only a benefit of achieving his objective. Taking it organizationally, it is important to understand: Are you clear on your goals for engaging in lean? If increased productivity or reduced costs are not your objectives, then your objective is blurred. Being clear on objectives allows for the selection of the right tools and the right approach at the right time.

2. What's the benefit to your employees?

Every employee or worker has different reasons for staying in his or her job despite various frustrations that may occur on a daily basis. Thus before you can ever be successful in integrating lean practices in your organization, it's important to first understand why employees come to work each day. Underlying this answer is the key to aligning employee benefits with the benefits achieved through lean.

3. Employee Empowerment acceptable?

Even though superficially lean may seem to be thought of as management initiative; but it's not. It's an employee opportunity. Lean offers the insights and tools to improve how work is done. For this reason it's critical that employees are given the freedom to make decisions that have an effect on their work habits i.e. operational effectiveness. Specifically employees must be given the required support in terms of opportunities, resources and support to effect the changes they feel are necessary.

Answering these questions will help any organizations to introspect on its lean commitment. Destructive Kaizen might seem bad, but try participating in an unplanned series of Kaizen events where objectives are unclear, value is weak and there is little opportunity for employees to take action on their ideas. You will get a taste of destructive Kaizen. It doesn't happen instantaneously but does set the scene for a slow and painful death of employee morale and interest. Thus rather than employees suffering death by a lean events such as Kaizen, clearly address the three questions above and watch engagement and let improvements build as a result.

Agile®: The New Definition of Software Project Methodology (With a case of Formula one racing)

- SandipSaha

Now days, if someone (who works in IT projects) talks about any project methodology being used in software organisations, 8 out of 10 (source: KPMG Survey) would tell, they are either following or implementing Agile® project methodology. Amid, of the growing concern about traditional software project methodologies being used, thought leaders of industries innovated and helped to evolve this project methodology from 1990s and finally named as Agile®, after a very successful gathering of industry thought leaders in Snow land , UT 2001. Then, whole software development industry slowly started to recognize its speed to capture changes in the process of software development and the ability of quick delivery of workable version to customer. And, as customers are always present in the scrum (cross functional software development team consisting 5-6 members in general with a customer representative and one scrum master, who drill into the software development and generate short story to accomplish within stipulated short time) it is evident, that speed of delivery and ability of quick incorporation of change in development process, are the main reasons for popularity.

Now, talking about speed; What speed do you think? Most of the organisations, takes 2- 3 weeks to deliver its workable content to user. Now in organisations, a term is being used, split-second decisions or risk losing to competitors. Split-seconds? That's usually an exaggeration, unless you're talking about Formula One racing.

Yes, Agile® is so useful a methodology, that it's now being used in Formula One racing as well. Now take a picture, in Formula One racing, 12 teams compete in 20 races every two weeks in cities around the world between March and November. Each team designs and builds its own car. Some specifications and rules change every year. So, you can imagine the necessity of speed is required for continuous delivery of software products in this arena, even small changes can take place in some seconds or minute when the race is happening, to maximize the chance of winning or to take better position. And, here Agile® comes. Now days, the racing industry is relying heavily on analytics and software systems. And the main challenge to software development team is to quickly deliver the analytical tools and visualization products (for analyzing pit activities) quickly in a time frame of 2-3 weeks, they get between races. Generally big changes happened during November to March. But as Agile® methodology increases collaboration of all teams, the development process gets more competitive inertia in this methodology.

The best example of such, you can get from Lotus F1 team. Lotus F1 Team is a British Formula One racing team. The team has competed under the Lotus name since 2012, following

renaming of the former Renault team based at Enstone in Oxfordshire. Lotus F1 Team is owned by Luxembourg-based venture capital group Genii Capital. Lotus F1 Team is named after its branding partner Group Lotus. The team achieved a race victory and fourth position in the Formula One Constructors' World Championship in their first season under the Lotus title. And this quick achievement was only possible due to incorporation of Agile® methodology.

During the 90 to 120 seconds it takes to run a lap in Formula One, engineers in the pit crew use telemetry and business analytics tools to find adjustments to make on a car racing at speeds of more than 185 mph. Every fraction of a second does count, says Graeme Hackland, IT director for Lotus F1, a three-driver team co-sponsored by Lotus Cars and Renault. At a recent race in Bahrain, a Lotus F1 driver lost first place by just three seconds. The goal is to produce better tools faster for both pit crew and car designers. Hackland says he also wanted to erase the perception that sometimes IT doesn't understand everything about how the pit crew and car designers like to work. "They wanted us to deliver more right the first time," he says.

The continuous communication between developers and users under Agile® development can clarify how the end product should look, feel and work much earlier in the process, says Margo Visitacion, an analyst at Forrester Research. But organizations underestimate the culture shock of going Agile®. "Collaboration is a lot different from taking requirements, throwing them over a wall and expecting perfection many months later," she says.

So, the above case let, what I compiled from the above mentioned sources, clearly indicates that, the ability and applicability of Agile® methodology, and provides a clear understanding, why 8 out of 10 software development firms want to leverage the benefits.

Rise of Ultron: Paper-Movies-Reality

- Abhilash Varkey Abraham

In the Marvel comic universe, Dr Hank Pym develops Ultron, a super intelligent thinking artificial intelligence system. The system developed at an exponential rate and started to think for itself and hatched plans to eliminate all human races, as it thought of humanity as a threat to its existence. Many of you, would be able to recall the same scenario in movies like The Matrix, Resident Evil and many science fiction movies and in Isaac Asimov's novels. Reading comics like The Avengers exposed me to Artificial Intelligence at an early age. Later on seeing it on the big and small screen was quite an exciting experience. But it prompted me to ask myself a serious question: Will the machines win? Thanks to the internet, I found that I was not alone in the quest to find the answer and that the danger was very much real. On July 27, 2015 The Future of Life Institute has presented an open letter signed by over 1,000 robotics and artificial intelligence (AI) researchers urging the United Nations to impose a ban on the development of weaponized AI with the capability to target and kill without meaningful human intervention.

The letter was presented at the 2015 International Conference on Artificial Intelligence (IJCAI), and is backed with the endorsements of a number of prominent scientists and industry leaders, including Stephen Hawking, Elon Musk, Steve Wozniak, and Noam Chomsky. The development of technology and its implementation moving towards a darker path would have been the necessity of bringing out this letter. Machines which can kill without loss of a human life can be considered a good move, but when the machine which cannot rationalise and emote does the killing, it's indeed a grave problem. The scenario would be neatly explained in the starting scene of the latest Robocop movie where a giant killing machine in a war zone kills an innocent child. Corporate organisations who are in a rat race to gain market share and maximising profits are unmindful of the fact that AI in the form of robotics and systems are at the heart of several operations across many industries, genetics, aerospace, medicine to name a few. The more data we feed these machines, the more technology is giving them power to think on their own. The greatest mind of Dr Stephen Hawking has also given us a warning and he has said that the complete achievement of AI will be man's last invention. Rapid development in areas of synthetic biology, robotics, and analytics has created a gap between what we have created to understanding its complete potential. James Barrat, author of "Our Final invention" has said that the machines, in order to ensure its existence may act dormant and act dumb and at the end be powerful enough to outsmart its creators, very much like Terminator's Skynet and Ultron. The major threat is the ability of the machines to think for themselves and their power to improve and create better versions of themselves.

Scientist Julie Daniel has claimed that AI can develop existing technologies like structural nano technology and can be able to control things on a molecular level. Dr Stuart Armstrong explains that AI may wipe out our existence because of malicious intent or because of a

simple human instruction, after all it's the consciousness of people developing AI set the goals and people with wrong intentions can create havoc on a global scale. There will be no way as to know and understand, how and why the evil intent is created. Technological Singularity coined by Ray Kurzweil, is the event in which an AI will develop on its own and create advanced versions of itself. The greatest weapon which singularity will bring upon is the Intelligence Explosion and the consequences will make sure that humans are pushed to the side lines for a very long time. Even in the development stages, AI can exhibit dramatic changes to various fields, the process and design which will be uncomprehendable to the human mind. The world was dominated by the reptiles, then humans. In the future it's going to be the machines. The domination of the machines may very well go against the evolution quote of Charles Darwin, "It's not the strongest nor the most intelligent species that survive, but the ones that are most responsive to change". So humans, be wary of what you create and let the creation not destroy the creator.

Seven Principles of Flexible Supply chain management – SohitAbrol

1) ***Adapt Supply Chain to Customer's Needs***: Both business people and supply chain professionals are trained to focus on the customer's needs. In order to understand customer better, we divide customers into a different group and we call it "segmentation". The most primitive way to segment customer is ABC analysis that groups customer based on the sales volume or profitability. Segmentation can also be done by product, industry and trade channel. Customer be segmented based on the service needs, namely, "sales and merchandising needs" and "order fulfilment needs". The customers may not know what they need until your competitors offer something different. For example, in 2011 Amazon initiated a program called Amazon Prime (free 2-day shipping and discounted 1-day shipping). Today, people are still discussing if this program makes sense. But one thing for sure, customer turns to Amazon more and more. The morale of this story is that you should "anticipate" the customer's needs as well.

2) ***Customize Logistics Network***: When you segment a customer based on the service needs, you may have to tailor the different logistics networks to serve different segment. However, this principle doesn't hold true for all situations. For example, if you were a contract manufacturer in China, you might already have different logistics networks for different customers. Each customer in US or EU might already control the source of raw materials, ask you to provide dedicated production lines, nominate air/sea carriers. So, logistics network design is a kind of initiative driven mainly by customer.

3) ***Align Demand Planning***: Across Supply Chain Supply chain practitioners are taught to share the demand data with trading partners so nobody has to keep the unnecessary stock. In

general, this principle holds true. But in the reality, only Wal-Mart is actively sharing the demand data to trading partners. There is a very interesting paper “Top-Down Versus Bottom-Up Demand Forecasts.

- If you make the demand forecast based on SKU/Customer level, using your own historical order data is more accurate than using the POS data you get from retailers

- If you make the demand forecast based on SKU/Store level, using the POS data you get from retailers is more accurate than using your own historical order data

The implication is that the absence of demand sharing is not necessary bad. But when you got the demand data from trading partners, you Must use it the right way

4) ***Differentiate Products Close to Customer***: Dell keeps components and assemble them only after customer places the order in order to increase the product variety. This principle is still true, but, there is another principle that you should consider.

“Standardization” is in the opposite polarity of “Differentiation”. For example, some cosmetics manufacturers formulate products and choose a packaging and labelling that complies with the regulations of multiple countries in Asia. So they only make one SKU that can be sold in 15 countries instead of 1 SKU/Country. By standardizing product appropriately, they can drive the cost down drastically due to the economy of scale. So standardization is something that you should also consider.

5) ***Outsource Strategically***: This is the principle that stands the test of time. In short, don’t ever outsource your core competency.

6) ***Develop IT that Support Multi-Level Decision Making***: An IT project shouldn’t be done in the isolation, business process reengineering should be done before implementing an IT project. This will equip with the full understanding about process deficiencies then one can determine what kind of technology that one really need.

7) ***Adopt Both Service and Financial Metrics***: The activity based costing (ABC) be implemented so you can determine customer’s profitability. However, there is the interesting twist about the ABC concept. However, it’s difficult to maintain an ABC costing model to reflect the changes in activities, processes, products and customers. Therefore, a refined concept called “Time Driven Activity Based Costing” introduced.

The Digital Effect On Business Process Management

-Chinchu William

According to International Data Corporation (IDC), by 2020 every business will be a digital business. There has been tremendous changes that traditional business processes have undergone in the past 10 years or so as companies transition into the digital realm the form of mobile, social networking, cloud, analytics and the Internet of Things all signs certainly seem to be pointing in that direction. So this article talks about how BPM can impact the business in digitizing their traditional way of doing it.

According to Gartner “business process management is the discipline of managing processes as the means for improving business performance outcomes and operational agility. Processes span organizational boundaries, linking together people, information flows, systems and other assets to create and deliver value to customers and constituents.” The digital era has certainly impacted BPM in various ways:

- 1.Cloud availability and pricing models for BPM suites that make the technologies available to a much broader marketplace.
- 2.Visual design and collaboration tools, including integration with familiar end-user applications (e.g., SharePoint, Visual Studio, etc.).
- 3.Separation of business rules from process logic flow, greatly simplifying changes when the business needs to change.
- 4.Event reporting, to notify administrators of critical events in ways that streamline and simplify process monitoring and optimization.
- 5.Content management, including support for unstructured data and rich media (video, audio) and additional document types (e.g., project and case management, etc.).
- 6.Social media integration
- 7.Easier integration with other third-party software through standard APIs, middleware, etc.

Customers at some branches of Bank of Tokyo Mitsubishi UFJ in Tokyo will soon be greeted by a robot, in what the bank says will be a first for any major financial institution in the world. The 58-centimeter robots, named NAO, can answer most basic customer service questions in 19 languages, as well as analyze customers’ facial expressions and behavior, the bank says. This example shows how BPM is making the business intelligent. It is intelligent BPM that is expanding the window of what can be automated, by enabling adaptable automation. Once a dirty word in BPM circles, “automation” will return to forefront, because in near future we will not be referring thoughtless script workflows, but adaptive and data-driven processes automated by

intelligent and distributed software agents managed through an “intelligent hub” of BPM. The data-driven transformation now well underway parallels a volume of data generated that is already nearly incomprehensible, but merely a fraction of what it will be. Consider all data produced from the beginning of history to the year 2002 that entire volume is now produced every 10 minutes. Yet within 5 years, the same volume will take less than a second. “Big Data” has never been so large, nor presented such a critical role within enterprises and the processes that drive them. In the era of the Internet of Things where “smart” homes, appliances, cars, phones, virtually imaginable device are all connected, BPM must and will be everywhere. With estimates of 30 billion or more connected devices, there will be far too many and interactions far too complex to keep pace with traditional software techniques.

BPM is already at the center of this, and its presence will grow enormously. Not simply automation, but emergent factors of such as process mining will be critical for uncovering engagement patterns, and the need for process management platforms to coordinate interaction and control of smart devices.

SIP Experiences

Summer Internship is a critical step for MBA students for enhancing their credentials and boosting student’s competitiveness. Here are some snippets regarding the internship experience of LOS students

My SIP was carried out in P.N Rao Suiting’s. This was my first industry experience. It was informative and an exciting journey which had a lot of learnings for me. My topic related to SIP was Identification of bottlenecks and reduction of lead time at PN Rao. Initially, I was a little sceptical about the whole SIP as I had no prior experience and my confidence was low. Later as I went in, I observed the functioning of the organisation for about 2 weeks. I identified that there is a scope for improvement and a scope for me to fit into the organisation. Then I worked on the same for about one and a half months. In the mean time I had fortnightly reviews with the top management of P.N Rao and we actually impressed them with numbers and showed them the flaws in the system. We got to interact with them and got to know how an organisation actually works and what top management requires from B school graduates. This was a beautiful platform that was offered to learn and explore the various opportunities in the field of lean. This resulted in tremendous boost in terms of confidence and knowledge in terms of practical applications.

-Dilip

I did my summer internship in Dr. Reddy's laboratories, Hyderabad, in the area of continuous improvement of Omeprozole. During the 2 months of the internship period, I related concepts learned in the classroom such as lean, six sigma tools and value stream mapping etc with industry practises. I got an exposure to the various profiles and opportunities present in the organisation in the area of operations. I learnt how to deal with the employees and how to manage the workers in the operations department. I realised the importance of GMP (good manufacturing process) in the manufacturing sector especially in the health sector& pharmaceuticals industries.

-Bhavana

Toyota is known for quality and true to its philosophy; Quality promise is just not in words but concentrated in each and every part of production. It has a good working environment with tremendous work culture. All the concepts of operations could be actually observed in the shop floor and easily understood as well. The internship in Toyota provided valuable hands-on experience in lean concepts. It also gave an opportunity to learn some of the Japanese best practices with respect to safety, respect to people, achieving operational efficiency etc. Also had an exposure towards the different processes involved in the manufacture of car.

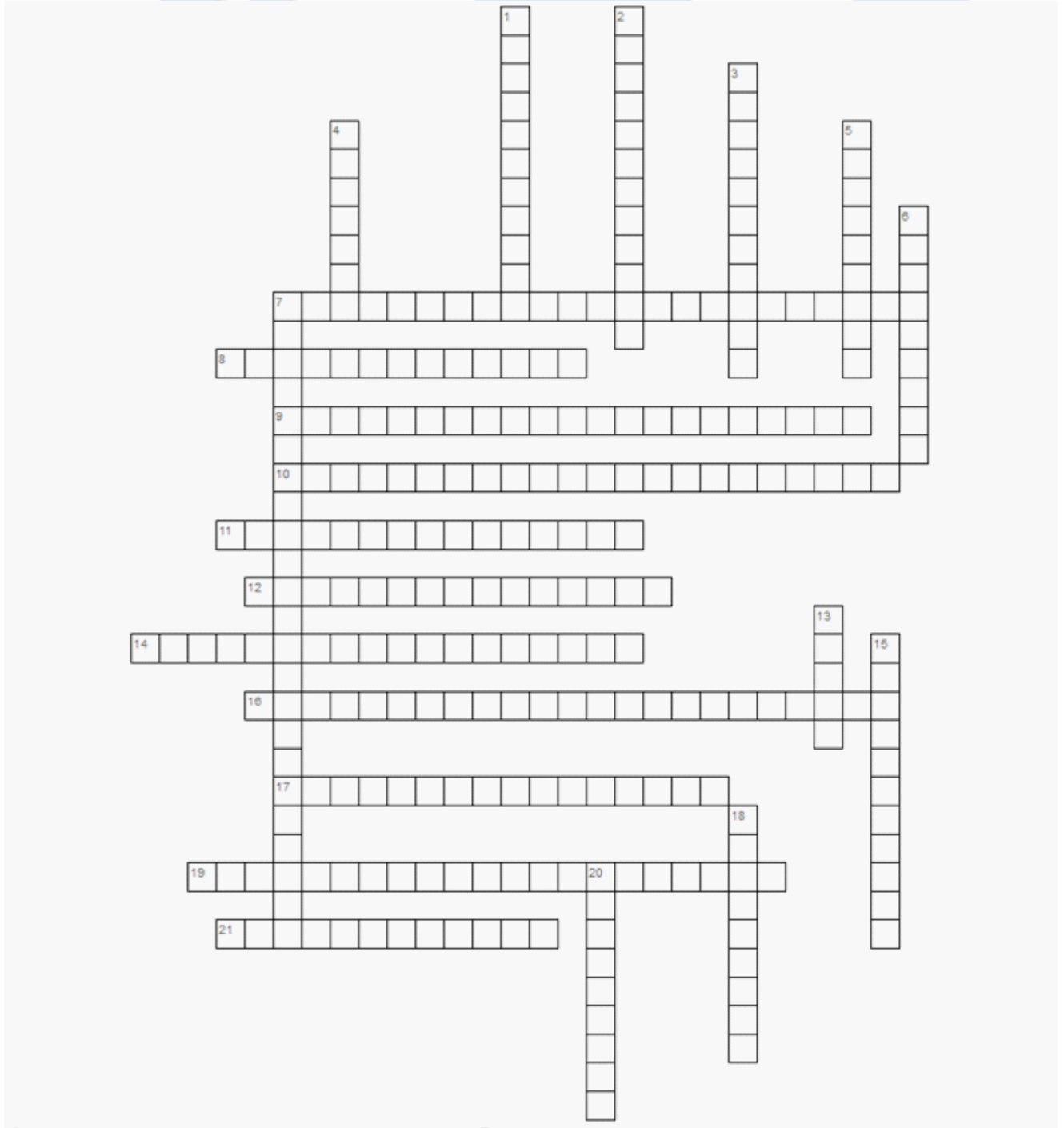
**-Sridevi R
1421454**

I did my SIP at Britannia Industries Limited, Bengaluru. The Replenishment department faced problems in initiating new employees to various processes in the department. The project was to develop planning Standard Operating Procedures for the Replenishment department of Britannia. My experience at Britannia was enriching as I got to interact and learn about various processes in Replenishment like demand planning, supply planning, material planning and promo planning. The internship gave me an opportunity to work closely with professionals and to develop my competencies.

**-Lisa Elizabeth Abraham
1421441**

Summer Internship in SABMiller India is best for people seeking career in supply chain. They provided us with a plethora of learning opportunities and were open to our suggestions. They mentored and evaluated us on regular basis helping us to align with the company's strategy. Their Internship program follows a strategically designed recipe of an effective learning with a pinch of fun!!

**-Akshatha M.K
1421436**



Across

- 7 It is a work measurement technique in which operations are divided into fundamental elements and time to complete each element is taken directly from the published Tables.
- 8 It is used to study where the journeys are irregular in distance and frequency.
- 9 This chart has been used for long time to display the operations, inspections, and their sequence for manufacture of a complete product in one figure.
- 10 This system is the most common form of PMTS.
- 11 The focus of the analysis is to minimize the cycle time of man or the operator.
- 12 was developed, which employs a longer time interval between successive frames.
- 14 This was the first work measurement technique developed by Taylor.
- 16 is used to display a micromotion study analysis.
- 17 includes additional components like transports or moves, delays and storages occurring during production.
- 19 It is a graphic representation of the simultaneous activities of more than one man or machine on a common time scale to show their inter-relationship.
- 21 It is used to estimate the percent of time that a worker spends on various tasks.

Down

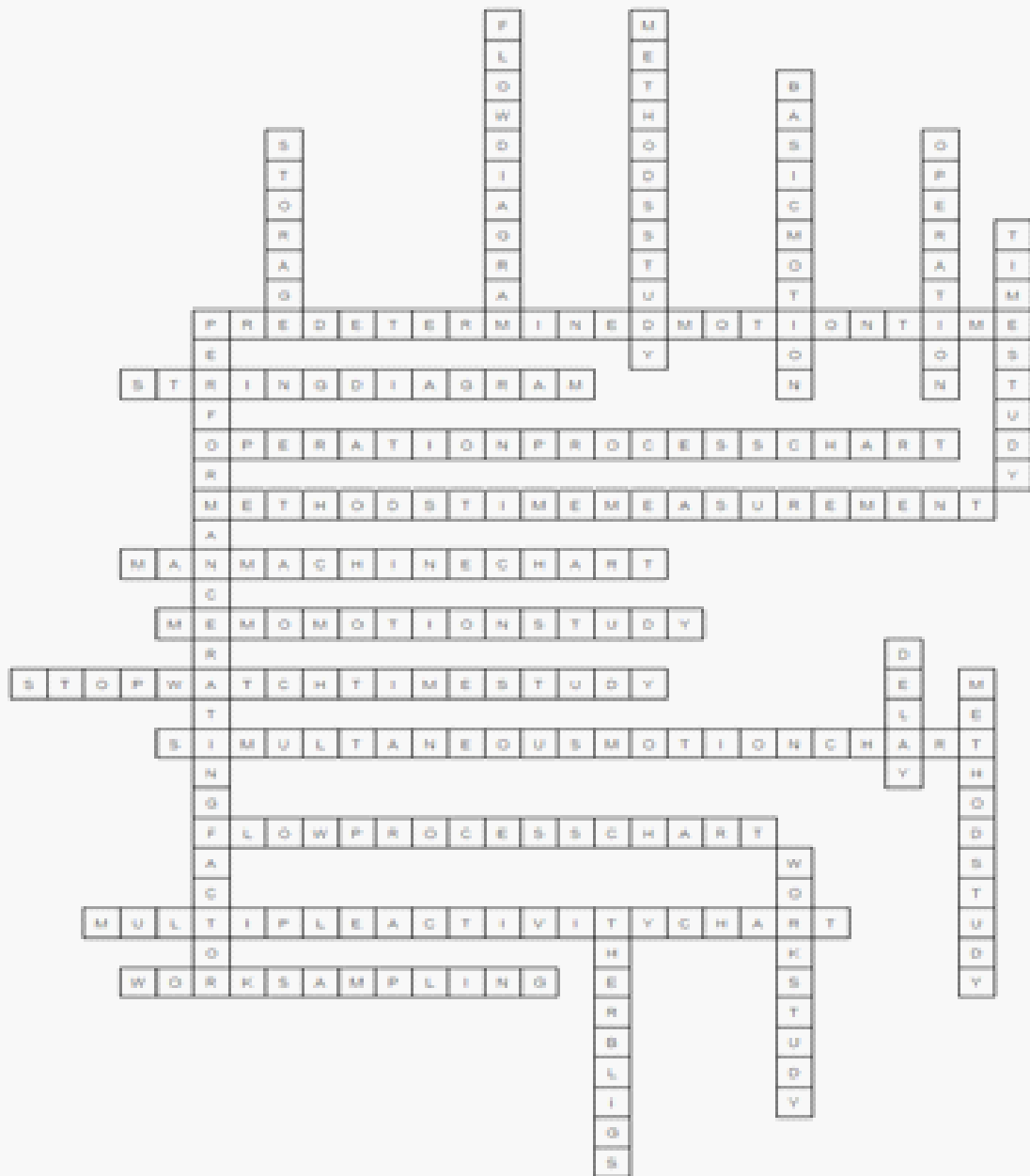
- 1 It is the plan view of a work to a certain scale and a line diagram which indicates the path followed by object under study. It shows the path followed by materials , man or machine.
- 2 is the study of detailed design of workstations, and also to some extent the relationships between workstations.
- 3 is defined as a complete movement of body member", such as: a hand moves from rest through space and again comes to rest.
- 4 indicates that the product has come out of production's control, and is under the control of another entity
- 5 includes all work performed by a worker or a crew at one location at one time.
- 6 is a structured process of directly observing and measuring (using a timing device) human work in order to establish the time required for completion of the work by a qualified worker when working at a defined level of performance.
- 7 is the observed pace of the operator compared to the analyst's concept of normal pace for the operation under study, considering applicable allowances for the operation.
- 13 implies that the product remains under production's direct control.
- 15 is the process of subjecting work to systematic, critical scrutiny in order to make it more effective and/or more efficient.
- 18 is the management technique to investigate all the factors affecting the efficiency and economy of an organization under review in order to improve it.
- 20 denote the fundamental motions of human activity.



Can You Guess the Brands Behind These Slogans?

- 1) The happiest place on earth.
- 2) Leave the driving to us.
- 3) The taste of a new generation.
- 4) A Passion for the Road.
- 5) Because You're Worth it

ANSWERS





L'ORÉAL
PARIS

SIGMA TEAM

UNDER THE GUIDANCE OF
PROF RAMAKRISHNAN N

STUDENT COORDINATORS

THOTA JAYASREE
SMITA
AMOL
RAJKUMAR
LISA
MANISHA

DESIGN

ASHISH BHATTACHARYA
ESWAR S